PROJECT INFORMATION MEMORANDUM (PIM)
COLLECTION, TRANSPORTATION & PROCESSING OF 3000 TPD C&D WASTE FOR BENGALURU URBAN DISTRICT

CLIENT

BENGALURU SOLID WASTE MANAGEMENT LIMITED
#30/1, THIMMAIAH ROAD, MILLERS TANK BUND AREA,
VASANTHNAGAR, BENGALURU-560 052

Prepared by RITES LTD

AUTHORED BY

RITES: PMC consultant to BSWML to provide support and services for the SWM related scope of services defined in the contract between BSWML and RITES

RITES Ltd. being a 'GO-TO' infrastructure consultancy company is dedicated to creating sustainable and efficient infrastructure solutions. RITES Ltd. approach is to innovate and adopt systems underpinning transition to a low-carbon future. Company's objective clearly states on leveraging the 'E' in RITES and make sustainability a touchstone for every activity. One of the sectors of operation for well diversified business model of company is Urban Engineering & Sustainability which emphasizes on following initiatives:

- National Clean Air Program (NCAP) implementation
- Environment, Social and Governance (ESG)
- Planning & Design of Solid Waste Management
- Source Apportionment Study
- Net Zero (Carbon Neutral) Studies/Carbon Credits
- Environment & Social Impact Assessment studies
- Pollution Abatement Studies
- Lake Conservation Programs
- Extended Producer Responsibility for Single Use Plastics

RITES has launched a new Green Mobility vertical to explore global markets in sustainability related projects. Under its Green Mobility vertical, RITES has institutionalized with Bengaluru City's sustainability projects. This initiative has been taken to provide comprehensive solutions to M/s Bengaluru Solid Waste Management Limited to hand its hold for their projects of Solid Waste Management.

RITES' Contribution to Sustainable Environment:

RITES is accurately aware of the importance of sustainable development and environmental conservation. Over the years, the organization has made considerable strides in its commitment to environmental sustainability, focusing on various aspects of its operations:

1. Green Transportation:
   RITES has been instrumental in the development of eco-friendly and energy-efficient transportation systems, particularly in railways. Its involvement in the expansion and modernization of the Indian Railways has led to the adoption of cleaner and more energy-efficient technologies, reducing the carbon footprint of rail travel.

2. Urban Mobility Solutions:
   RITES has actively worked on urban transport projects, including metro systems and bus rapid transit systems (BRTS). These projects help decongest city roads, reduce vehicular emissions, and promote the use of public transport, thereby enhancing urban air quality and reducing pollution.

3. Sustainable Infrastructure Design:
   RITES incorporates sustainable design principles in its infrastructure projects. This includes using energy-efficient materials, green construction practices, and eco-friendly designs, such as rainwater harvesting and green roofs. These efforts aim to reduce the environmental impact of infrastructure projects.

4. Renewable Energy Integration:
   RITES promote the integration of renewable energy sources, such as solar power, into transportation infrastructure. This not only reduces energy costs but also reduces the carbon footprint of transportation facilities.

5. Environmental Impact Assessment:
   RITES conduct thorough environmental impact assessments for its projects, identifying potential ecological impacts and implementing mitigation measures. This ensures that development occurs with the least harm to the environment.

6. Eco-friendly Technologies:
   RITES invest in research and development of eco-friendly technologies for transportation and infrastructure. This includes developing sustainable alternatives to conventional construction and transportation methods.

7. Environmental Compliance:
   The organization adheres to stringent environmental regulations and encourages its clients to do the same. It plays a significant role in ensuring that projects are executed while complying with environmental laws and regulations.

DISCLAIMER

This Project Information Memorandum (PIM) has been prepared by RITES as a consultant for Bengaluru Solid Waste Management Limited (BSWML) to provide an overview of the existing facilities and the status of C&D Waste Management and handling processes. The information contained herein is based on field surveys and data collected from BSWML offices.

It is important to note that the PIM is intended to offer a general understanding of the current situation, and the assessment of such facilities shall be an integral part of the Bidder's or Applicant's responsibility. RITES, as the consultant and author of this document, and BSWML & BBMP, do not assume any liability for deviations from the information provided in this write-up. This document is meant to serve as a reference and initial guide for interested parties, and it is recommended that Bidders or Applicants conduct their due diligence comprehensive assessments to ensure accurate and up-to-date information before participating in any related projects or initiatives.

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Project Information

Introduction:

The BSWML acting through and represented by Government of Karnataka and are engaged taking up the scope of services to attain the Garbage Free City (GFC) of Bengaluru by implementing various policies as the MOU of BSWML. In this connection, BSWML is intend to establish a dedicated mechanism to handle the removal of C&D waste through a scientific Mechanism. To this effect, M/s BSWML appointed M/s RITES Ltd a PSU under Ministry of Railways to prepare inception/Feasibility/ Detailed Project reports to appoint the agency for the Collection and Transportation of the Construction and Demolition (C&D) Waste from various parts of the Bengaluru city. In this context, BSWML advised M/s RITES to take up two independent studies to prepare the detailed projects reports to provide the scientific solution to remove the C&D waste from source of its generation and to eliminate the black spots and to establish the processing plants to process the C&D waste at different parts of the out skirts of the Bengaluru city.
A study report prepared by Senior Environmental Officer of KSPCB has been taken as the basis to assess the quantities generated in Bengaluru city which has been made in more meaningful with four zones of the city and bifurcated the C&D waste in the zones

As per the report the quantity statement is as follows:

(1) North & Northeast zone: 2541.00 TPD
(2) East and Southeast Zone: 2675.00 TPD
(3) West and Southwest Zone: 802.5. TPD
(4) West and Northwest Zone: 696.00 TPD.

There existing C&D waste processing plants are located as one at Kannur with 750 TPD processing capacity established by Private entity and run by collecting the tipping from BBMP to process the C&D waste and Chikkajala with 1000 TPD Capacity established by BBMP and operated by private vendor and there is one more processing plant at Anekal established and operating by private a builder. Though the plants are established to process the C&D waste with designated capacities, and there is huge quantum of C&D waste being generated but the same is not transported to these existing two plants. The plants at Kannur & Chikkajala are located at North and eastern part of the city. The assessed quantity of C&D waste being generated in this part of the city is about 2500 TPD but the minimum required quantity 1750 TPD is getting to the processing plants. This is due to lack of the established scientific mechanism to collect & Transport.
Hence BSWML entrusted the work of the detailed study to M/s RITES Ltd to establish the scientific mechanism to collect the C&D waste from the source generation, primary and secondary transportation and its financial implications towards the capital cost, O&M cost and its implications to assess the tipping fee model. Accordingly, the Project Information Memorandum (PIM) has been prepared and the Technical Economic Financial Reports (TEFR) have been prepared.
Based on the technical parameters, the number of the vehicles for the Primary transportations and for the secondary transportation has been assessed as follows:

Primary Collection:

1) 7.5T GVW Vehicles: 73 Nos.
2) 5.0 cum capacity containers: 924 Nos

Secondary Collection

1) 28.00 GVW Vehicles – 65 Nos.
2) 20.00 Cum capacity containers: 231 Nos

Based on the above requirement, the capital cost required to procure the vehicles has been arrived and the same is as follows:

Project Revenue Streams:

a) Sand (as per KPWD SR S. No. 64 for M sand the rate per Cum is Rs. 1476/-)
b) Aggregate (as per KPWD SR S. No. 61 for recyclable concrete of 10mm down size the rate per Cum is 1190/-)

After arriving at the capital cost and tipping fee etc, it has been decided to go for the 100% Bidders investment model by paying the tipping fee to the successful bidder.

Summary

A. Proposed Minimum requirement of Vehicles for C&T

S No.	Item Description	Capacity	Quantity
1	**Primary Transportation** A) Hook Loaders B) Containers	7.5 T GVW 5 cum	73 924
2	**Secondary Transportation** A) Hook Loaders B) Containers	28 T GVW 20 cum	65 231

B. Proposed Components of P&D Plant

The processing plants of capacity 500 TPD & 1000 TPD will be having optimum at processing capacity of 200 TPH.

S. No.	Description		
	Civil	Electro Mechanical	Plant & Machinery

1.	Area For Raw Material Storage	Grizzly Feeder	JCB/Bulldozer
2.	Area For Finished Material Storage (4160 Sqm Area)	Jaw Crusher	CCTV
3.	Electrical Panel Room	Cone Crusher	
4.	Covered Parking Area	Wet Screen	
5.	Security Room	Vibro Feeder	
6.	Office Room	Hydro Cyclone	
7.	Recycling Store Work Shop Area	Log Washer	
8.	Sludge Tank, Sludge Tank1, Settling Tank, Water Storage Tank		
9.	Labour Cloak Room With Toilets		
10.	Steel Platform		

The proposal consists of construction, operation and maintenance of four 500TPD and one 1000TPD processing facilities, C&D waste of South and South East, (b) South and Southwest, (c) North and Northwest regions of city which generates about 4175TPD is catered. This proposal also provides outline to establish a scientific mechanism to collect & transport C&D waste from around the city to the proposed locations of processing facilities using primary and secondary transportation and its financial implications towards the capital cost, O&M cost and its implications to assess the tipping fee model.

GLOSSARY

ABBREVIATIONS	FULL FORM
BBMP	Bruhat Bengaluru Mahanagara Palike
BCC	Bengaluru City Corporation
BUA	Bangalore Urban Agglomeration
BUD	Bengaluru Urban District
BSWML	Bengaluru Solid Waste Management Limited
BFSI	Banking Financial Services Insurance
CAPEX	Capital Expenditure
C&T	Collection & Transportation
COD	Commercial Operational Date
CPCB	Central Pollution Control Board
CERC	Central Electricity Regulatory Commission
C&D	Construction and Demolition
CBD	Central Business District
CPHEEO	Central Public Health and Environmental Engineering Organization
CSR	Corporate Social Responsibility
DPR	Detailed Project Report
DBFOT	Design Built Finance Operate and Transfer
DBO	Design, Build, Operate
EPC	Engineering, Procurement, Construction
GPS	global positioning system
GHG	Green House Gases
G.o.K	Government of Karnataka
GoI	Government of India
GVW	Gross Vehicle Weight
HZ	Hitachi Zosan
IEC	Information, Education, and Communication
IT	Income Tax
KCDC	Karnataka Compost Development Corporation
KSERC	Karnataka State Electricity Regulatory Commission
MAT	Minimum Alternate Tax
MoHUA	Ministry of Housing and Urban Affairs
MTS	Mini Transfer Station
MW	Megawatt
NGO	Non-Governmental Organizations
O&M	Operation & Maintenance
OPEX	Operational Expenditure
PPP	Public Private Partnership
PMC	Project Management Consultancy

RITES	Rail India Technical and Economic Service
RWAs	Residential Welfare Associations
SERC	State Electricity Regulatory Commission
SPCB	State Pollution Control Board
SHG	Self-Help Group
SCT	Secondary Collection and Transportation
TPD	Tonnes per Day
ULB	Urban Local Bodies
UDD	Urban Development Department
UN	United Nations
VGF	Viability Gap Fund
WMD	Waste Management Department
YoY	Year on Year

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CHAPTER -1 INTRODUCTION

1.1 Understanding of the Project:

Waste management is one of the most pressing issues for governmental authorities in India due to rising urbanisation, increase in waste generation and types of waste, lack of space for waste processing facilities, limited financial resources and inadequate waste management systems and infrastructure. In this context, the Construction & Demolition Waste Management Rules, 2016 ("C&D Rules 2016") were framed by the Ministry of Environment, Forest and Climate Change to address the issue of increasing C&D waste issues and identify the roles and responsibilities of different stakeholders including government bodies and the waste generators in the waste management ecosystem. The rapid increase in waste generation through construction is demanding for a renewed attention to the increasing problem of C&D waste management.

Presently, Bengaluru is facing significant problems due to existing disposal practices of generated waste incurring high cost due to lack of proper planned infrastructural facilities; the open dumping in the expanding zone of the city poses severe problems to the structures constructed on these old dumps.

The Bengaluru Solid Waste Management Limited (BSWML) intends to select a suitable concessionaire for carrying out the work relating to collection and transportation of the Primary & Secondary Transportation besides establishment of Processing facilities at various locations to process C&D waste in the jurisdiction of Bengaluru City.

Bengaluru City is generating about 6700 TPD of C&D Waste which has been established through a detailed study conducted by KSPCB during 2019-2020. But the quantity generated is not reaching to designated processing plant which are established by BBMP with 750 TPD at Kannur and 1000 TPD plant at Chikkajala at norther parts of the Bengaluru city within BMA limits. Hence it is decided to establish a proper transportation network to collect the C&D waste and transport the same to the existing two plants own by BSWML as primary task. In addition to transport the waste to the existing plants, the existing waste being generated within BBMP limits to be transported and to process the same, it has been decided by BSWML to establish a dedicated processing plants through PPP model by providing land to propose/establish about 4 processing plant of 500 TPD each and one plant of 1000 TPD at identified locations of: (a) South and South East, (b) South and Southwest, (c) North and Northwest.

The Ministry of Environment, Forest and Climate Change (MoEF&CC) notified the Construction and Demolition Management Rules in 2016 for all ULBs to develop effective strategies for C&D waste streams as cities are continuously building and expanding infrastructure and built spaces. Most cities do not have formal demolition permits and developers hire local contractors for demolition. Even government agencies like PWD invite bids for demolition based on what contractors would pay for recoverable. The recoverable of immediate secondary market value, such as metal rods, pipes and fixtures, wooden frames, etc., are salvaged by the informal sector, typically from demolition sites, leaving behind the "rubble" composed of bulky materials such as concrete, stones, bricks and mortar, etc. A small fraction of this rubble is used for back-filling in construction projects, both for private projects and public works, and the same demolition contractors arrange for its transportation to sites where it is needed. It is estimated that such uses may account for only 10-30% of generated C&D waste depending on the site and region. The remaining fraction of C&D waste is disposed of, either in designated landfills/dump sites or often in unauthorised

places such as road sides, river beds and low-lying areas causing a host of nuisance, safety and environmental problems.

1.2 Assessment of Challenges and Roadblocks

There remains a host of challenges and roadblocks faced by both government agencies and the private sector that are hindering a wider and quicker adoption of C&D waste management initiatives. It is important to properly understand these challenges so that proposed actions can target them effectively.

1. **Rapidly Expanding Areas and Increasing Waste Generation*:*** The quantities of solid waste generated in urban areas is a factor of change of land use, growth in city either in the vertical or horizontal and increase in population. These are either planned or unplanned. In case of Bengaluru the city is expanding in all directions and the existing land uses is changing. Being one of the major nuclei of IT hub and associated infrastructure the city has shown the maximum growth. This has led to urbanisation which thereby has led to increase in waste generation. Also, the socio-economic condition of the people has improved leading to growth in per capita growth in waste generation.

2. **Resource Shortages:** Due to expansion in the city and spread and growth of population the areas to be served for solid waste management are strained. In Bengaluru the existing infrastructure does not receive the focus because of the location of existing facilities and there by affecting the services. The resources are not augmented with the speed and number which leads to compromise in quality of services and creating of C&DW vulnerable points in the city and increasing in dumping ground. Also, in pursuit to provide road, drains and water supply and other basic infrastructure the attention to the existing C&D Waste Management System often receives lower priority when allocating resources, resulting in insufficient funding and a lack of trained personnel.

3. **Use of Inappropriate Technology:** With change in population and the existing equipment and machinery which in use are not pursuant to the requirement as they were often repurposed for a defined load and capacity. The same is not able to cope up the pressure. The equipment and machinery which are sourced from other industries lead to underutilization of existing resources and reduced efficiency.

4. **High Cost of Manpower:** A significant portion of expenditure, is spent on manpower, with most resources directed towards waste collection. Improper practices, such as littering on roadsides, lead to increased collection work, directly affecting costs. The resource recovery and disposal which should be also be one of the main focus areas is not allocated with trained and skilled manpower there by affecting any waste management. This leads to opening dumping and no focus on resources recovery, scientific treatment and disposal of waste.

5. **Low System Efficiency**: The C&D waste management system lacks proper planning and operates in an unscientific manner. Work norms are often unspecified, and there is inadequate supervision of collection and transportation staff as there is no proper mechanism of Attendance recording. Vehicles are not adequately maintained, and no preventive maintenance schedule is adhered to. There is also a lack of coordination among different components of the system, resulting in an inefficient management system.

6. **Urbanization:** Urbanization is a global trend, and its impact is more pronounced in developing countries. High population growth, reduced opportunities in rural areas, and a shift from low-paying agricultural occupations to higher-paying urban jobs contribute to urbanization. This, in turn, leads to increased waste generation due to changes in lifestyle, further exacerbating health risks and urban environmental degradation. The growth in urbanization and consumerism makes Solid Waste Management an increasingly challenging task in India. Financial constraints, institutional weaknesses, inappropriate technology choices, and public indifference toward C&D Waste have compounded the issue.

The Present Transport mechanism is also under numerous packages which are under purview of BBMP. In the managing of these packages without having any Transfer Station facility resulting in haphazard way of transporting from Primary C&T to the Secondary Transportation Vehicles, Either on road side or at public places.

1.3 Population growth

Bangalore underwent swift expansion during the period from 1941 to 1951, becoming the sixth-largest city in India by 1961. Between 1991 and 2001, Bangalore emerged as the fastest-growing metropolis in India, experiencing a remarkable growth rate of 38% during that decade. In the 2001 census, the city's population was recorded at 56.86 lakh, but the new draft of the City Development Plan by BDA considered the inclusion of population in peripheral villages, estimating the metropolitan area's population to be 61.70 lakh.

The population growth of Bangalore is evident when comparing census figures from 1981, 1991, 2001, 2011, and beyond, with the city's population standing at 2.92 million, 4.13 million, 5.10 million, and 8.42 million, respectively. Projections suggest that the population of Bangalore Urban Agglomeration (BUA i.e. BBMP Population and Urban District) is expected to reach approximately 13.32 million (excluding Floating Population) and 14.77 Million (including Floating Population) by 2023. A key factor contributing to this substantial growth is the cosmopolitan nature of the city, drawing people from diverse locations, particularly as a prominent IT hub in South India.

With the rapid urbanization, waste generation has surged to 6700 TPD over seven decades since 1941. These statistics place considerable strain on all civic infrastructure services, including C&D Waste management.

1.4 NGT directions

The Honourable NGT Monitoring Committee of Office Amendment 125/2017 opened to have C&D waste processing plants one at each in all 4 directions of the city. The illegal dumps which are present now can also be transported to these units. This will encourage for sustainable management and bring down the emissions levels besides its effective management to prevent dumping in the water bodies.

Bengaluru has since then developed 6 strategies to enable its shift from ‘Dumping’ to ‘Processing’ with the Guidelines of the C&D waste generation as below:

i. Investing in stream-wise processing of waste: These include aspects like the enforcement of segregation at source, investing in infrastructure and technology for processing waste, and creating an efficient collection and transportation system.
ii. A data-driven approach for estimation & planning: This includes the understanding of waste generators, data collection through field validation, and re-assessing normative standards and their application for a close estimate.
iii. Enabling market dynamics by creating new economic opportunities: Opening up the private market and empanelment of vendors for the servicing of Bulk Generators, application of the polluter-pay principle to generators and enabling Public-private partnership for setting up of processing facilities.
iv. Awareness creation & enabling behavioural change: The city has already hosted large-scale events and several small events for consensus building, awareness creation, training and skilling. In addition to this, it continues to conduct clean-up drives and post adverts and flyers, manuals, etc.
v. Use of technology for data collection & monitoring: Using technologies like GIS mapping, apps, tracking systems, biometrics etc. are being used to enable transparency, enhance efficiency, increase accountability and overall help monitor the new C&DWM system.
vi. Capacity building & enabling legislative reforms: This includes building institutional capacity within the government through the setting up of an C&DWM cell, capacity building through the inclusion of informal sector workers, exercising Extended Producer Responsibility (EPR) and enabling legislative reforms by appropriate amendments and notification.

Hierarchical Mapping of Bengaluru City

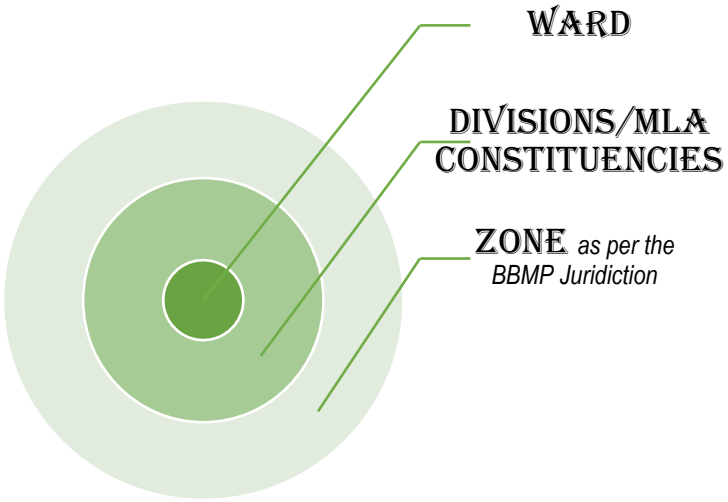


Figure 1: Hierarchical Mapping of Bengaluru City

The most elementary administrative division within Bengaluru city, overseen by the BBMP, is the ward, where councillors are elected. There are 225 wards, each falling within the divisions/MLA constituencies of the Karnataka State Legislative Assembly, totalling 30 such divisions/constituencies. These, in turn, are organized under eight sanitary zones, reflecting a hierarchical structure designed to facilitate the efficient and effective management of BBMP's operations.

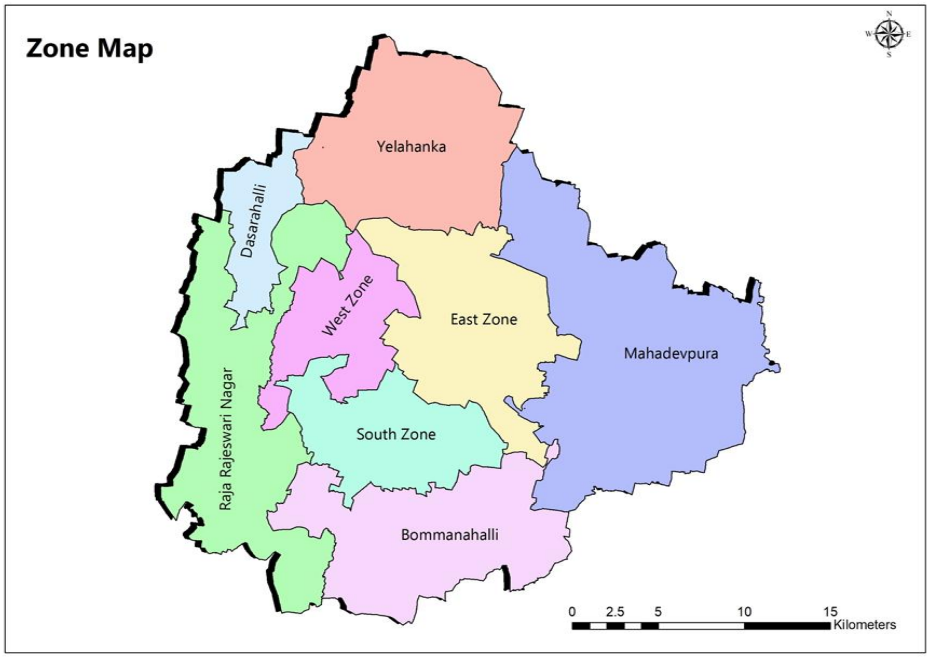


Figure 2: Zone Map

Formation and Jurisdiction: BBMP was formed in 2007 by merging the Bangalore Mahanagara Palike (BBMP) with several surrounding municipalities and panchayats. This merger was intended to create a single administrative body for the entire urban area of Bangalore.

Administrative Structure: BBMP is headed by a Mayor who is elected by the members of the BBMP Council. The council consists of elected representatives called corporators, who are elected by the residents of various wards within the BBMP's jurisdiction.

Bruhat Bengaluru Mahanagara Palike is headed by the Chief Commissioner who is appointed and deputed by the State Government of Karnataka for performing duties and functions of municipal corporation such as

- Urban planning and development.
- Road and transportation infrastructure.
- Waste management and collection.
- Health and hygiene services.
- Property tax collection.
- Birth and death registration.
- Building permits and regulation.
- Parks and green spaces maintenance.
- Challenges and Development Initiatives.

Bangalore has experienced rapid urbanization and population growth, leading to various challenges such as traffic congestion, infrastructure development, and environmental concerns. BBMP has initiated several projects and programs to address these challenges, including the development of the metro rail system, road expansion projects, and efforts to improve waste management and green spaces.

- *Political Structure*: BBMP is governed by a council with a mix of elected representatives from various political parties. The political landscape may change with each municipal election.
- *Finances:* BBMP's revenue primarily comes from property taxes, grants from the state government, and other sources. Managing finances and ensuring adequate funds for infrastructure development and services is a critical aspect of BBMP's responsibilities.

Recently government passed the resolutions to collect the user fee from the C&D waste generators (other than the Bulk Waste Generators) through BESCOM through monthly electricity bill for adequate C&D waste management within BBMP Limits and fix service charges to BESCOM.

1.6 Bengaluru Solid Waste Management Limited (BSWML)

Bengaluru Solid Waste Management Limited (BSWML) is a government owned company / exclusive set up made by the Bruhat Bengaluru Mahanagara Palike (BBMP) to implement and execute specific solid waste management (SWM) projects to deliver efficient and affordable C&D Waste Management Project / Infrastructure to the citizens of Bengaluru. Thus, BSWML is the project implementation and monitoring authority for the proposed project.

Bengaluru Solid Waste Management Limited (BSWML) is chaired by Additional Chief Secretary of Government of Karnataka (G.o.K)/ UDD. The Chief Commissioner/BBMP is the Managing Director. The Special Commissioner (BBMP - HQ) is the CEO of the BSWML. There is Board of Directors constituted as per the rules of the company. The Chief Engineer and the Chief General Manager (Tech) is the technical head of the BSWML associated with Engineering staff at various ranks. The overall Technical matters shall be reviewed through the technical committee appointed by company as per the extent of the rules.

1.7 Project Management Consultant – RITES LTD

RITES LTD is a 'GO-TO' infrastructure consultancy company that is dedicated to creating sustainable and efficient infrastructure solutions. RITES approach is to innovate and adopt systems underpinning transition to a low-carbon future.

In pursuit of improvising and providing continuous best of services in the field of C&D Waste Management and intends to focus on resource recovery at every stage of C&D waste handling and disposal, M/s BSWML appointed M/s RITES Ltd for the Project Management Consultancy (PMC) services to hand hold M/s BSWML by providing the technical support to address the issues on C&D Waste Management and to implement appropriate solutions to avoid the landfills by adopting various technologies to process to mitigate the problems being faced by Bengaluru.

1.8 Summary

- The Master plan for Bengaluru anticipates a population of over 2.0 Crore by 2031. While this may be very high, it would be reasonable to assume a steady increase of population in range of 1.80 Crore. The city has highest number of INR 1.0 million per capita earners in the country and the economic outlook looks positive. The institutional base in the city complements the growth of services industry, high technology and start up. The city attracts a huge FDI share of the country.
- The city has about 1.3 Crore square feet of quality space in the commercial sector of real estate, with lowest vacancy levels in the country. The developments are predominantly in the identified locations of (a) South and South East, (b) South and Southwest, (c) North and Northwest. The release of space in the centre of the city and the suburban areas are addressing the need by adding additional construction areas on a rapid manner to meet the demand.
- Residential sector has been growing at a steady pace – the overall inventory available in the city is moderate and the demand for affordable housing is significant. Bannerghatta road, Hosur Road, Eastern Parts followed by the North side towards the Airport is picking up

By considering the demand and supply of real estate requirement, the city expected to increase the requirement of construction activities thus it is expected to drastically increase generation of the volume of the construction and demolition waste.

The present status indicates that the scientific management of C&D waste has been one of the major concerns for Urban Local Body (ULB)- Bengaluru. Though BSWML has implemented many programmes and issued many guidelines, and Swatch Bharat Mission programme of vision of India to clean the cities however, despite BSWML focus on the principles for C&DWM Slogan of 3R (Reduce, Reuse, Recycle),

the implementation programmes with the active engagement of the citizens of the city, there still considerable scope to recover value from waste.

The forward message of the Secretary MOHUA has indicated while releasing the guidelines on Circular Economy in C&D Waste that it is possible by adopting a circular economy approach which is central to achieving the vision of a clean India. Circular Economy solutions are embedded in the concept of generating zero waste through innovations that can utilize discarded materials to produce reusable and recyclable products.

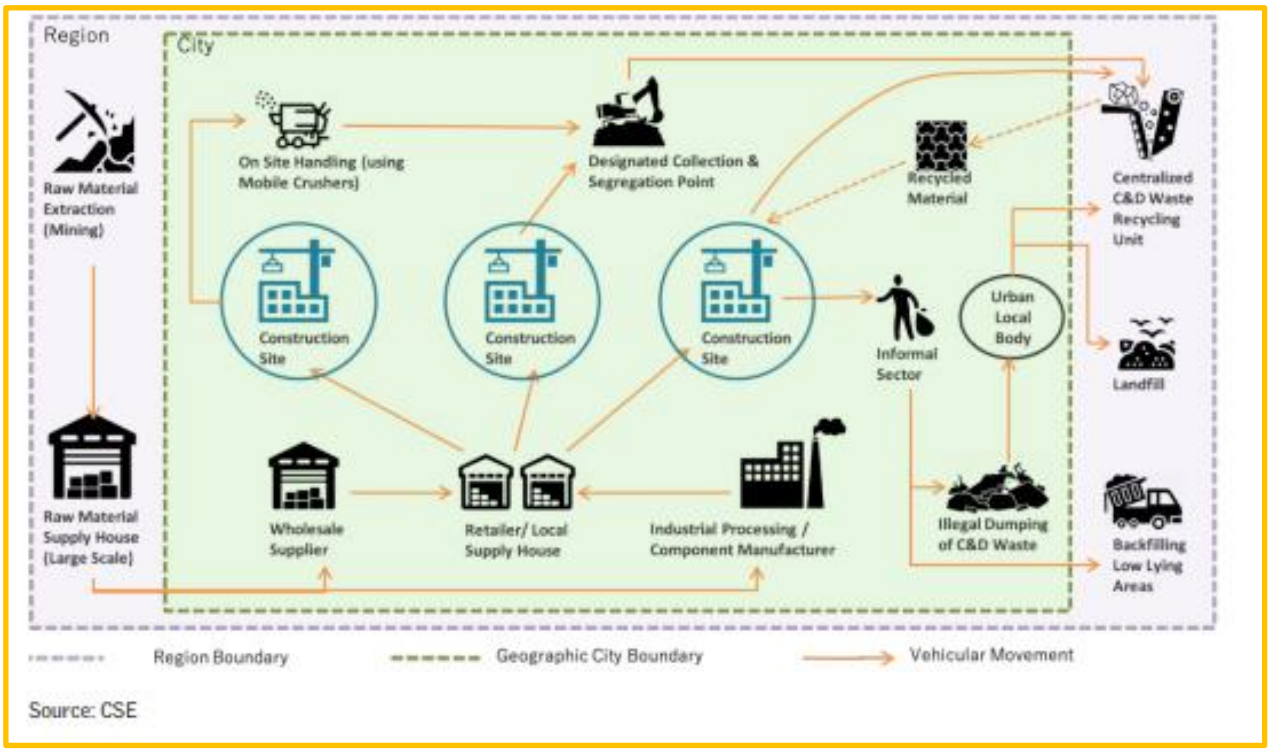


Figure 3 - Geographical Distribution of C&D Activities

CHAPTER 2: C&D WASTE PROFILE

2.1 The Construction Sector in India Today

Construction in India is poised to become the world's third-largest construction sector by 2018 (Global Construction Perspectives and Oxford Economics, 2015). It currently contributes about 7% to India's GDP (2014). Market forecasts for the 12th Five Year Plan period (2012-2017) indicate that the cumulative output of the construction industry is likely to be INR 52.31 billion (USD 790 million); contributed almost equally by the buildings and infrastructure segments (Planning Commission, 2012). The Indian government has doubled the proposed public spending on the sector to USD 1 trillion (Figure 1A). However, resource constraints may limit public investment and the share of private investments is expected to increase significantly in the future (Equity Master, 2012).

As per the CPCB Guidelines of March 2017 and as per Section II and Rule 3, the estimated generation of C&D waste is as below:

a. Range 40-60 kg per sq.m of a new construction
b. Range 40-50 kg per sq.m of a building repair
c. Range 300-500 kg per sq.m for demolition building.

Although there no standard calculations or yardsticks are established to assess the quantity of the generation of C&D waste, however, it has been indicated in the MOHUA circular economy guidelines states that there is about 25% of the total waste being generated in any urban cities population more than 10 million population shall be the guiding quantity towards the C&D waste.

Table 1 – Type of Waste Generators

CATEGORY	TYPE OF WASTE GENERATORS
A	**Micro generators:** The small generators who occasionally generate C&D Waste less than 50 kgs from minor house repairs, broken ceramic sanitary ware like tiles, bathtubs, commodes, washbasins etc.
B	**Small Generators:** Those that generate C&D waste during building renovation, remodelling or petty construction, repair or maintenance works etc. where the total amount of C&D Waste generated in the entire project is more than 50 kgs and less than 20 MT per day.
C	**Bulk generators:** Waste generators who generate more than (a) an aggregate of 300 MT of C&D Waste per month and/or (b) pertains to demolition work covering an area of 600 square metres; and/or (c) construction or building repair work covering an area of 6000 square metres
D	**Service providers:** They are defined as authorities who provide services like water, sewerage, electricity, telephone, roads, drainage etc. who often generate C&D Waste during their activities, which includes excavation, demolition and civil work.

Table 2 – City wise Operational C&D processing plants of India

CITY	PLACE	CAPACITY (TPD)	OPERATION STAUTS
Delhi	Burari	2000	Operational
	Mundka	150	Operational
	Shastri Park	500	Operational
Noida	Sector 80	150	Operational
Gurugram	Basai	300	Operational
Ghaziabad	Ghazibad	150	Operational
Thane	Daighar	300	Operational
Indore	Devguradia	100	Operational
Hyderabad	Jeetimedla	300	Operational
Bengaluru	Chikkajala	1000	Operational
	Kannur	750	Operational
Ahmedabad	Gyaspur Pirana	1,000	Operational
Tirupati	Tukivakam village	150	Operational
Vijayawada	Vijayawada	200	Operational
Chandigarh	Industrial Area Phase 1	150	Operational
Surat	Surat	300	Operational

Table 3 – C&D waste composition in India

Waste Sub-Streams	As per Technology Information Forecasting and Assessment Council (TIFAC), 2021 (India)	As per MCD survey, 2004 (Delhi)	As per survey by Infrastructure Leasing & Financial Services (IL&FS) Eco smart, 2005 (Delhi)	As per study by University of Florida 2009 (India)	As per Coimbatore City Municipal Corporation survey, 2015 (Coimbatore)
Soil/Sand, Gravel	36	43	31	35	49

Bitumen	2	0	0	2	0
Metals	5	0	0.4	5	4
Masonry/ brick	31	15	59	30	19
Concrete	23	35	0	25	23
Wood	2	0	1.5	2	2
Others	1	7	7.6	1	3

The first step in ensuring a proper C&D waste management is the estimation of waste generation and composition. In India, a systematic database on C&D waste generation does not exist. According to an old estimate, India produces 12–15 million tons of C&D waste annually. Centre for Science and Environment (CSE) estimated the C&D waste generated in India about 530 million tonnes, for the year 2013, based on certain assumptions on the existing building stock and previous estimates. Building Materials & Technology Promotion Council (BMTPC) worked out the annual C&D waste generation in India to be 100 million tons, based on the existing housing stock data and the rate of renovation and newer construction activities during 2005-2012. Another study has estimated that 716 million tonnes of urban C&D waste were produced in 2015. The unavailability of reliable data on C&D waste generation is a hindrance to proper waste management in India.

Demolition activities contribute to a major share in the C&D waste generation. Demolition waste determines the total C&D waste generation of a region characterized with rapid urbanization and development. Demolition of a structure can occur under the following circumstances: upon the end of service life of the structure, under government requisition, destruction by natural force, demolition of illegal structures, legally reported demolition or illegal demolition.

Central Pollution Control Board conducted various studies through experts and noted that minimum 12 % and up to 25% of the waste generated in any urban cities shall contribute to the C&D waste, but the C&D waste management is not placed in a scientific manner.

CHAPTER 3: EXISTING SYSTEM OF SOLID WASTE MANAGEMENT IN BENGALURU

Bengaluru Solid Waste Management Limited (BSWML) has been given the task to handle the C&D waste scientifically in its Processing & disposal scheme. Hence BSWML has taken an initiative to processing & dispose of the Construction & Demolition Waste in a scientific manner by adopting the Collection, Transportation, and processing of the same at designated locations based on the availability of the quantity being assessed through various studies being conducted either by BSWML or by KSPCB

The impact of the TA will be to improve C&DW management in Bengaluru city, to adopt the existing policies and practices to update and implement the available guidelines while adhering to the policies, and the outcome will be an agreed set of policy recommendations to regulate C&DW management towards collection, transportation and promote C&DW recycling.

A Broad Assessment of C&DW in Bengaluru City in BMA limits. This will be carried out through a literature review, case studies of C&DW recycling success stories conducted by other agencies, departments and stakeholders, the policies and current practices of C&DW management at construction and/or demolition sites, the perceptions about recycled and conventional construction materials, and the barriers to increased application of recycled materials. The assessment will include an economic analysis to identify the probability of a CDW market failure and mitigations.

A review of international good practice in C&DW management and recycling. This will include in-depth case studies to be conducted in selected advanced economies with high C&DW recycling rates, as well as some of the reports prepared by CPB, MOHUA & MOEF&CC etc. The review and understanding and drawing out the inference from the report will document hindering and enabling factors for sustainable C&DW management and recycling.

Preparation of a synthesis report, which will be prepared which will summarise and present the outputs of this TA.

Purpose of This Report:

This report analyses the current C&DW management practices in the BMA limits and identifies the main obstacles to improvement towards the best practice to establish ***"collection, transportation and processing of the C&D waste".***

3.1 Current Ecosystem of C&DW

Based on the steps Bengaluru 2016 report the Figure 04 maps out the C&DW value chain starting from a construction or demolition site (C&DW generator) and ending at either disposal sites (designated and undesignated) or being recycled back into the construction industry. BSWML's current CDW disposal regulations govern mainly the CDW generators and Demolition and Transportation Contractors (DTCs); however, found that much of the CDW goes unaccounted for or is dumped at illegal sites by private DTCs. To facilitate CDW recycling, BSWML will need to ensure that maximum CDW reaches the recycling units, implying some mechanism for DTCs to either transport it directly from the generation site to recycling

plants or from the disposal sites. The DTCs could also be provisioned to offer segregated CDW at additional charges to the user. BSWML has not been able to fully enforce the CDW norms in their existing shape. Therefore, to facilitate a functioning CDW supply chain, it will have to significantly step-up enforcement. If successful in doing so, BSWML can effectively free itself up from expending significant resources on CDW processing & disposal. The products from CDW processing in Bengaluru must have a market to facilitate their diffusion and uptake as building materials. Given the scale of expected construction activity in Bengaluru over the next 5-10 years, the demand for building materials already exists locally. To compete against conventionally produced building materials, CDW-based products will require not only certification from appropriate testing and certifying authorities but also to be demonstrated as cheaper substitutes without compromising on strength and other important aspects. The two functions can also be performed within the city boundaries, for example, Bengaluru University and Indian Institute of Science (IISc) contain facilities to test and certify products from CDW; institutions such as CREDAI, Karnataka Public Works Department (KPWD), Karnataka Housing Board (KHB), Bengaluru Development Authority (BDA), etc. can significantly help promote CDW-based building materials by using these for the numerous non-structural applications where they can easily replace conventional products. This can be done via institutional purchase mandates, white-papers, awareness campaigns, etc.

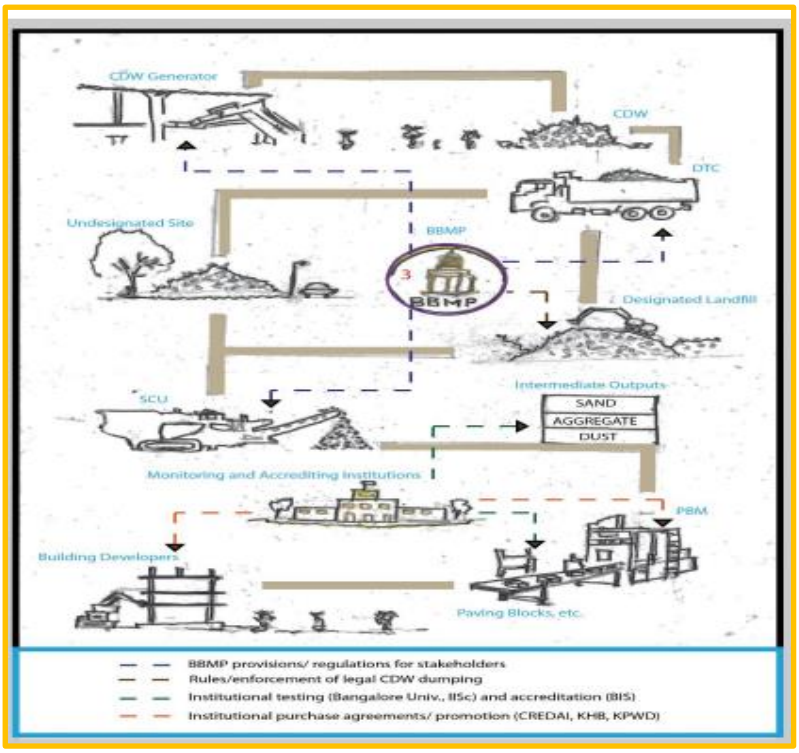


Figure 4 – Schematic diagram of waste collection & processing

3.2 Methodology

This report studies the CDW management policies established by MOHUA & MOEF&CC and NITI AAYOG and the current status in the BMA limits through a literature review and interviews with key stakeholders, and a broad study on KSPCB report of C&D waste assessment and the need for significant improvement in C&DW management and recycling; and analyzes the obstacles to the application of recycled building materials and the feasibility of market-based solutions for incentivizing CDW recycling. A Road map shall be established for assessing the rate for the Collection & transportation cost and processing cost shall be established after taking the circular economy policy into consideration.

1.

3.3 Waste Types and Quantities

This study focuses on the types of CDW which are the responsibility of the Ministry of Housing, Urban Development Authority (MOHUA), and therefore does not include wastes from the road, hydraulic and hydropower structures, railways, and tunnels.

The main types of CDW are:

- Waste from excavation from Non-Bulk generators
- Waste from demolition of old buildings
- Waste from construction sites, and
- Waste from building fit-out and decoration.

The types of C&DW generated depend on construction methods and the types of buildings being demolished. Modern buildings are primarily constructed from reinforced concrete, whereas buildings currently being demolished in BMA limits, dating from the 1960s to 1990s, include a large proportion of Sheet roofing structures, bricks, and stone buildings.

Among the above C&DW components, a mature recycling system has been developed for asphalt blocks, and there is also active recycling and reuse of waste metal, plastics, wood and glass and these recycling metals are out of this study. The remaining large amount of surplus spoil, scrap bricks and tiles, waste mortar and concrete blocks have become the current focus of CDW management and recycling. From environmental protection and disposal safety perspectives, management of surplus spoil is one of the key issues, but there is no mature recycling technology for this material.

3.4 Laws and Regulations

Laws

The government of India by NITI AAYOG & MOEF&CC and MOHUA has formulated laws for CDW management and solid waste management.

- Environmental Protection Law
- Cleaner Production Promotion Law

- C&D Waste Pollution Prevention Law
- Circular Economy Promotion Law
- Building Law

However, the provisions of these laws are expressions of principle, low in operability, and therefore they do not adequately provide guidance or deter illegal behavior: they can only provide a basis for policy formulation. It is recommended that there should be a series of supporting administrative laws, regulations and systems that can truly provide guidance for C&DW management and recycling. C&DW are regional materials, and therefore provincial, municipal, and county governments should also be able to formulate CDW management methods.

Standards

There are C&DW recycling-related standards, including those already issued and those under formulation, and many standards that are already issued.

3.5 C&DW Management and Recycling Authorities

National Level

The information manual has been developed in order to simplify the understanding of the C&D Waste Management (C&DWM) System that is set in place by BSWML, for Bengaluru city. It includes:

Clause 15(a) of C&D Waste Management (C&DWM) Rules, 2016 stipulates that the local authorities shall "prepare aC&D waste management plan as per state policy and strategy on C&D waste management within six months from the date of notification of state policy and strategy and submit a copy to respective departments of State Government or Union territory Administration or agency authorized by the State Government or Union territory Administration."

- The C&DWM plan encompasses:
- Institutional strengthening.
- human resources development
- technical capacity building
- financial capacity and arrangements (public-private partnership [PPP] framework);
- Community participation.
- legal framework and mechanism for enforcement; and
- Public grievance or complaint redressal.

The C&DWM plan should consider a long-term planning horizon of 20–25 years. Short-term implementation plans covering 5 years each should be slotted within the long-term plan for ease of implementation. The short-term plan should be reviewed and updated once every 2–3 years for any mid-course correction as required. Local authorities should ensure that the short-term plan is aligned with long-term planning and implementation.

Under C&D Rules, the C&D bulk generators & service providers are required to submit a waste management plan and get appropriate approvals from the Local Authority before starting

construction or demolition or remodeling work. Under Rule 6(7) of the C&D Rules, Local Authorities are required to

examine and sanction the waste management plan of the generators within a period of one month from the date of its submission or the date of approval of building plan, whichever is earlier. The project needs to demonstrate in the plan at the end of construction that 100% of the waste generated on site is received at the debris site and is either recycled or reused to obtain no objection clearance for the project.

- C&DWM Manual and Guidelines 2016 is a handbook for A quick understanding of C&D waste management (C&DWM) in the Indian context.
- States the aspirations of CLEAN BENGALURU and the road map to achieve.
- Important documents that provide the larger official mandate by MoUD, Swatch Bharat Mission, Karnataka Government, and the Karnataka High Court.
- Detailed data and information at the ward level, will help support and guide the implementation on the ground.
- Although all departments performed their duties still there is need to improvise the laws. MOHUA is in charge of the management of source and final use of CDW; whilst ULBs are responsible for the management of CDW recycling companies.

C&D Waste Management (C&DWM) is a strategic approach to C&D Waste Management (C&DWM) in a sustainable manner by considering the generation, segregation, transfer, sorting, treatment, recovery, and disposal of C&D waste in an integrated manner, with an emphasis on maximizing the efficiency of resource use.

CDW recycling enterprises are regarded as “common enterprises” when the State Commission Office of Public Sector Reform defined the responsibilities. According to the *“Notice on urban domestic waste treatment charging system and promoting waste treatment industrialization”* (NDRC [2002]872), urban C&D waste explicitly included CDW and spoil, therefore, construction waste recycling facilities should be regarded as “public utilities”. Referring to solid waste management, urban infrastructure shall be managed by the centralized construction department, which is conducive to the implementation and enforcement of policies.

3.6 Challenges

1. Some of the major Constraints in the development of the C&D waste disposal Road Map Inefficient Planning Norms:

Building Law and government C&D waste announcements don’t consider CDW at all, and there are no provisions for building demolition. The administration and management only care about construction while demolition is overlooked. There is a lack of waste prevention and minimization of concepts. There is no CDW generation statistical system or unified calculation standard. The existing regulations don’t have any quantitative targets on CDW emission, recycling and disposal, or standards and requirements on CDW pollution control, which brings difficulties in the actual management. The existing management is basically following the mode

from the era of planned economy, i.e., the CDW administrative units bear the responsibilities of qualification approval and also shoulder the tasks of supervision and law enforcement. This kind of arrangement mixes administration and enforcement and weakens the effectiveness of macro management functions, which has seriously limited the development of CDW recycling.

2. Lack of appropriate provisions, randomly dumping hard to stop

At present, the PRC's "Housing construction and decoration quote" does not include construction & demolition waste disposal costs but has construction & demolition waste removal fees only, which has not changed for many years and is generally low. At the same time, random dumping of construction & demolition waste has not been recognized as a serious crime, attracting just simple low fines, and most contractors are more interested in short-term profits. Most CDW is dumped directly despite the fact that the CDW recycling enterprises suffer from a lack of materials.

3. Unsorted CDW affects resource treatment costs and product quality.

Currently, waste demolition is separated from recycling and reuse: the management of demolition waste is not regulated, and there is lack of evaluation of both construction and demolition waste and detailed management. Specifically, engineering demolition is generally done by a demolition company. Due to the absence of regulation on sorting and storage, (except metals), demolition enterprises will store waste concrete, broken brick, soil, wood, and plastic together, sometimes also withC&D waste . The CDW recycling enterprises have to sort the waste. This significantly increases the treatment cost, and the quality of recycling products is also affected.

4. Stakeholder Analysis

The project owner, construction unit, design institute and government are involved in source generation. The project owner is the major player during demolition and construction; at the source generation stage, the project owner is in the center. The major concerns of design institutes include incorporating their ideas into the building while meeting the requirements of the project owner, completing as many works as possible in the shortest time, and accomplishing work which complies with standards. The construction unit is concerned about how to complete the construction at the fastest rate and with the least resources and cost inputs. The government expect less CDW generation. Their expectations, responsibilities and obligations should be properly coordinated.

5. Midstream Industry - Recycled CDW products

A. Management of the construction waste transportation industry

The construction waste disposal administrative licensing and other construction licenses are not bound to each other. Approval documents, engineering drawings and other relative materials of the construction project shall be submitted to the approval authority, i.e., the Urban Management

Administrative and Law Enforcement Bureau for the CDW disposal administrative license. However, the relative procedures and filings have not been done appropriately in compliance with the regulations. Meanwhile, some vehicles are modified in order to save transportation expenses and carry more CDW, which increases the safety risks during transportation. Uncontrolled dumping of CDW in areas where CDW recycling plants suffer from shortages of material is quite common.

The mutual cooperation and linked enforcement mechanism are insufficient between functional departments. Traffic police, public security, housing construction, urban management and highways departments are all involved in CDW transportation. Nevertheless, the departments lack mutual cooperation and information sharing, which results in low efficiency.

B. Difficulties in land use approval for CDW recycling

At present, CDW land use is not guaranteed. The high cost of CDW transport results in reliance on nearby land. However, the CDW recycling land is not included in the urban construction plan in many cities and the investment for CDW recycling does not meet the marketization standard. Thus, the land problems hinder CDW recycling development.

C. Environmental assessment approval for the CDW recycling project is difficult

The products of CDW recycling enterprises are mainly building materials, belonging to the "construction and processing enterprise" category. Building material processing enterprises are forbidden to build factories in urban areas by the environmental departments of many local governments in compliance with the laws and regulations, which may add difficulties for the factories to obtain authorization under the EIA process. Meanwhile, to demonstrate the environmental friendliness of CDW recycling, as well as to facilitate the administrative permit, if the word "waste" remains in the project name, the local residents disagree with the construction of such facilities and negotiation with the residents is difficult.

D. High costs and investment in CDW recycling

At present, the CDW recycling industry is still in the primary stage. Due to the diversity and complexity of the raw materials of CDW, the underdevelopment and high cost of relative disposal technologies and equipment, as well as the costly environmental investment, recycled CDW products are high price and consequently cannot achieve good sales. Although it may involve the government administrative departments, demolition units, transport enterprises, and construction units, using the unit for the development of CDW recycling, the industrialization for CDW recycling needs negotiation and coordination among the entire industry chain.

6. Downstream Industry - Utilization of Recycled CDW Products

A. Lack of mandatory regulations for recycled CDW products

Many provinces and cities require that the infrastructure engineering investment by governments (including roads, landscaping, public toilets, buildings, pavements, river channels and embankments) shall use a certain percentage of recycled CDW products according to the relative proportion of the city. However, the execution of the regulations remains to be improved, in

which the recycled CDW products are in excess of demand and products for public infrastructure are unavailable. Meanwhile, the above regulations restrain the application scope of recycling products, which hinders the actual application.

B. Lack of completed standards for recycled CDW products

Although the production standards are generally complete, the corresponding evaluation and product certification standards for recycled CDW products are incomplete and insufficient, which prevents construction units from judging the current products correctly, resulting in reduced use of recycled CDW products.

C. Lack of price competitiveness for recycled CDW products

Screening, crushing and other relative treatment processes are needed for the recycled CDW products, which increases the labour and relative processing costs. Also, the promotion costs are rising considering the lack of subsidies, which decreases the price competitiveness of recycled CDW products.

D. Traditional conception hinders the use of recycled CDW products

Recycled CDW products are mainly recycled aggregate, recycled brick, and recycled concrete, which illustrates the product's characteristics well. But this kind of nomenclature is not in accordance with any current standards, which increases the engineering difficulties. Also, developers do not agree to use words like “recycled” when describing construction materials, as it is unacceptable for the public and may influence the sales of houses.

7. Obstacles in Promoting Recycled CDW Products

Based on the above analysis, the obstacle to the market promotion of CDW recycling comes from various parts of the industrial chain, involving not only influences of macro-level policies but also micro-level problems arising in the development of enterprises.

2.

3. Economic Analysis of the PRC CDW Recycling Market Failure

The economic analysis under this Study is carried out by means of empirical analysis and whole industrial chain comparative analysis. The cost elements of CDW generation and sorting, CDW removal and transportation, CDW digestion and CDW beneficial use are analyzed from the perspective of the whole production process of CDW recycling. Cost computation and comparative analysis are conducted by means of standardized processing of data sampled from the individual cases of fixed crushing CDW recycling, mobile crushing CDW recycling and CDW landfill. Costs of different CDW recycling technologies as well as prices of recycling products and common construction material products are compared and analyzed.

The analysis shows that construction waste recycling technology generates marginal economic benefits. Without proper policies and instruments for subsidizing, it is very hard for all types of recycling facilities to be financially viable. Products of fixed treatment technology have a better marketing advantage despite their higher investment cost than mobile treatment technology which is limited by process equipment.

The financing costs of different types of enterprises have not been considered in the study, i.e., all the investment is considered made by the enterprises fully with their own capital. If such financing costs are considered, the economic benefits of both fixed and mobile technologies are expected to be lower, which is one of the obstacles to the market application of construction waste recycling technology.

According to the study, due to the absence of measures for mandatory dumping and transportation of construction wastes, there is not a stable source of materials for construction waste recycling enterprises, resulting in the absence of stability of revenue for enterprises engaged in, for example, fixed construction waste recycling and also bringing certain impacts on their market sustainability.

The sales price in the market is not an obstacle influencing the market application of recycled CDW products because there are occasions when their prices are lower than ordinary construction material products. It is more a factor of market acceptance of recycled CDW products. Their narrow application and the absence of a uniform quality certification and accreditation identification system in the sector cause some problems in marketing.

3.7 Present scenario of C&D waste management in Bengaluru

1. The) BSWML is responsible for managing the C&D waste generated in Bengaluru, which is one of the fastest-growing cities in India. The current scenario of C&D waste management in Bengaluru is far from satisfactory, as the city generates around 5,760 tons of waste every day.
2. BSWMLhas been facing various challenges in the management of C&D waste due to inadequate infrastructure, lack of proper waste segregation, and improper disposal methods. The C&D waste collected from collection point is not segregated, which leads to mixed waste being dumped in landfills, causing environmental and health hazards.
3. Bengaluru's disposal sites are overloaded and have exceeded their capacity, leading to waste spilling over and causing environmental and health problems. The BBMP has introduced various initiatives, including the 'Swachh Bengaluru' campaign, to encourage citizens to segregate waste at source, but its implementation has not been successful.
4. There is a lack of awareness among citizens about the importance of waste segregation, which is essential to ensure proper waste management.

3.8 Existing C&D waste management plan

At present there is one C&D processing plant owned by BBMP/BSWML at Kannur has a capacity of 750 TPD processing capacity daily and another processing plant capacity of 1000 TPD at Chikkajala and both are operated by M/s Rock-line. Though the processing capacity of both plants is about 1750 TPD daily, it is not able to operate not even 10% of the total processing capacity. One of the reasons is due to the lack of standard transport mechanisms.

3.9 Assessment of the C&D waste Generation

Though there are many assumptions are available to assess the C&D waste generation, but there is no yardstick to define the volumetric quantity of the C&D waste hence a detailed study has been conducted by the Karnataka State Pollution control board during year 2020-2021 to establish the existing C&D waste generation and its impact has been assessed

- As per the above said detailed study, it has been noted that about 6800 TPD of C&D waste is being generated on daily basis in BMA limits and this C&D waste is being handled through an un-organized sector to carry through the non-regularized vehicle in open trucks and dumped in open areas, adjacent to storm water drains and in lakes.
- The trucks being deployed by private agencies are not meeting any regulations and nor are they carrying to any defined disposal sites or neither disposing at existing plants.
- As per the KSPCB study report (list attached) over the last 30 months i.e. from 1.1.2020 to 31.7.2022, Bengaluru generates about 6700 Tons of C&D Waste per day. Seen that during the peak of Covid such developmental activities have taken place. The estimated quantity is based on the physical verification of some of the dumping lots and based on the earmarked sites for the demolition (Le meridian Hotel etc.). Based on the calculations the estimated C&D waste is being generated in Bengaluru city is about 7000 Tons per day. At least 70 to 90% of this waste can be processed, however, it ends up in landfill, storm water drains or lake beds.
- Based on the above-said detailed assessment, It shall be seen that the generation of waste is more towards the North, North East, East, South East and Southern parts of Bangalore and moderate towards the South Western part of Bangalore.
- At present, there are two C&D processing plants with a capacity of handling 1000 Tons/day at Chikkajala and 750 TPD at Kannur. Despite the city generating 6700 (7000) Tons/day of C&D waste, the unit shall be operating at only 10 percent of its capacity due to insufficient raw material receipt. One of the main reasons for this is the distance criteria of the location of the processing plant and unorganized disposal system.
- From the total estimated C&D waste of 6700 TPD, a portion of the C&D waste can be planned to transport to the existing Plants located at northern part of the Bengaluru city which are having 1000 TPD capacity plant at Chikkajala and 750 TPD plant at Kannur through dedicated transportation mechanism and the balance can be planned to establish with collection, transfer, transport and process under single window mechanism.

3.10 NGT directions

- The Honourable NGT Monitoring Committee of OA 125/2017 opined to have C&D waste processing plants one at each in all 4 directions of the city. The illegal dumps which are present now can also be transported to these units. This will encourage sustainable management and bring down the emissions levels besides its effective management to prevent dumping in the water bodies.
- Bengaluru has since then developed 6 strategies to enable its shift from ‘Dumping’ to ‘Processing’ with the Guidelines of the C&D waste generation as below:
- **Investing in stream-wise processing of waste**: These include aspects like the enforcement of segregation at source, investing in infrastructure and technology for processing waste, and creating an efficient collection and transportation system.

- **A data-driven approach for estimation & planning**: This includes the understanding of waste generators, data collection through field validation, and re-assessing normative standards and their application for a close estimate.
- **Enabling market dynamics by creating new economic opportunities**: Opening up the private market and empanelment of vendors for the servicing of Bulk Generators, application of the polluter-pay principle to generators and enabling Public-private partnership for setting up of processing facilities.
- **Awareness creation & enabling behavioral change**: The city has already hosted large-scale events and several small events for consensus building, awareness creation, training and skilling. In addition to this, it continues to conduct clean-up drives and post adverts and flyers, manuals, etc.
- **Use of technology for data collection & monitoring**: Using technologies like GIS mapping, apps, tracking systems, biometrics etc. are being used to enable transparency, enhance efficiency, increase accountability and overall help monitor the new SWM system.
- **Capacity building & enabling legislative reforms**: This includes building institutional capacity within the government through the setting up of an C&Dcell, capacity building through the inclusion of informal sector workers, exercising Extended Producer Responsibility (EPR) and enabling legislative reforms by appropriate amendments and notification.

3.11Assessment of pollution due to existing transportation

The other major setback in continuing to operate with the existing Transport mechanism which results in huge pollution as listed below

1. Pollution caused by Trucks.
2. The disturbed flow of traffic due to truck movement.
3. Un organized transportation
4. Un organized collection

Pollution Load Caused by a 10 Ton Single axle Truck Transporting C&D Waste:

The average mileage of a 10 Ton capacity truck: 4 Kmpl (on actual grounds It shall be about 2 to 3 KMPL which is much less than standards)

Average distance to be travelled by truck to transport 10 Tons of C & D waste: 60km Fuel required: 15 litres

Carbon dioxide Produced by Burning 15 Liters of Diesel: 15 x 2.62 kg =39.3 kg

According to the Project report from IISc, it shall be observed that 390 Truckloads of C&D wastes are dumped daily in the dump sites and the majority are dumped in low-lying areas and crates created by stone quarrying.

At a rate of 10 Tones per Truck, to transport 1000 TPD, 100 Trips are needed, and this may result in the emission of 4 Tons of Carbon Emissions per day.

Table 4 - Pollution Caused by a 10 Ton Single axle Truck while Transporting C&D Waste

Average truckloads/day in Bangalore city	390 (as per IISc Report)
Carbon Dioxide produced /truck/ load	40 kg approx/h
Carbon dioxide produced by 390 truckloads	15.6 Tons of Carbon dioxide / day
	i.e., **5694** Tons / year

By considering the above and to maintain a pollution and dust free city, It shall be essential to establish a dedicated collection, transportation and processing unit for C&D Waste.

3.12Need for upgradation of C&D Waste transportation & processing units

i. **Improved waste management**: Upgradation of C&D transportation and processing units will help in improving the overall management of C&D waste generated in the city. The upgraded facilities will be equipped with the latest technology and equipment to ensure efficient and effective waste management.

ii. **Increased efficiency**: With the upgrade of transportation and processing units, the efficiency of the waste management system will be increased. This will result in faster transportation and processing of waste, reducing the time taken to clear waste from the collection centres.

iii. **Reduced environmental impact**: The upgradation of C&D transportation and processing units will also help in reducing the environmental impact of waste management. The modern technology used in the upgraded facilities will ensure that waste is disposed of in an environmentally friendly manner, reducing the carbon footprint of the waste management process.

iv. **Cost-effective**: Upgraded C&D transportation and processing units will help in reducing the overall cost of waste management for BBMP. The increased efficiency will lead to faster processing and transportation of waste, reducing the overall cost of waste management.

v. **Compliance with regulations**: Upgraded C&D transportation and processing units will help BBMP comply with the regulations set by the Central Pollution Control Board (CPCB) and Karnataka State Pollution Control Board (KSPCB) for the management of C&D waste.

3.13 GUIDING PRINCIPLES FOR MANAGEMENT OF C&D WASTE

The State of Karnataka will focus on the 3R principle (i.e., reduce, reuse and recycle) for the management of C&D Waste generated within the state. In addition, the state works towards financial viability of C&D Waste processing and increasing the awareness levels and capacities of different stakeholders such as government officials, construction/real estate industry, public works department etc. with regard to C&D Waste management. This is elaborated below:

- Source reduction measures such as preservation of old buildings, optimisation of space in new buildings, designing building and infrastructure which reduce use of construction and material on site
- Using deconstruction3 prior to demolition to salvage reusable materials from the construction site where the items which are usable directly are screened out from the debris and put into the intended use without further processing. These could include useful products like doors and windows, bricks, structural steel that can be taken out with little extra efforts and put into reuse without much processing
- Once the C&D Waste has been segregated and reusable items are taken out, the leftover waste should be recycled to the extent possible. This is also vital for ensuring that minimum amount of waste is sent to landfills
- Many new recycled products are now available like recycled aggregated, fly ash bricks, pavement bricks/paver blocks, salvaged usable materials from demolition sites for reuse. To support recovery practices, market space to receive and sell salvaged materials from demolition, recycled products will be developed in the state of Karnataka
- Create awareness about the responsibility of citizens, institutions and community to manage the C&D waste generated by them and encourage citizen and industry participation in the C&D Waste management systems. This will include behavioural and attitudinal changes in people and entities using traditional building materials by creating awareness about suitable alternatives.

CHAPTER 4: JURISDICTION OF PROPOSED PROJECT

4.1 Project Area Information:

- Karnataka State Pollution Control Board (KSPCB) conducted a detailed study and assessed the generation of C&D waste base of the field survey held during 01.01.2020 to 28.06.2021.
- The study was conducted on each ward under each zone.
- The nature of the project and detailed out based on the layout development and individual construction
- The average C&D waste generation for the new construction as per the CPCB norms It shall be 40 to 60 KGs per Sqm of BUA which is average of 50 Kg/Sqm.
- The nodal officer under his guidance a dedicated team has been established to assess the C&D waste and the calculations based on the team is placed at annexure. The summary of the C&D waste generation based of KSPCB assessment from the below table is about 6715.03 TPD

Table 5 - C&D waste generation based on KSPCB assessment

NO	PARTICULARS OF BENGALURU	C&D WASTE GENERATED IN TONNES
1	Data of Consents accorded 1.1.2020 to 31.7.2022 (30 Months) by KSPCB	2810943.11
2	Smaller projects less than 175 Flats or less than 2.75 L SFT (considered as 50% of above, as they are more in number)	1405471.56
3	Demolition of buildings (can be considered 10% of the total buit up. Example one Le Meridian Hotel demolished a 10 Lakh SFT of building)	421641.47
4	The public works, metro and smaller independent repair and demolition at 50% of the major projects	1405471.56
5	TOTAL C&D WASTE GENERATED IN 30 MONTHS	6043527.70
6	AVERAGE TONS OF C&D GENERATED PER MONTH	201450.92
7	**AVERAGE TONS OF C&D GENERATED PER DAY**	**6715.03**

C&D waste generation Jurisdiction

The total assessed C&D waste within BMA jurisdiction has been dived into 4 zones by dividing the BMA layout with central Axis-X and Axis-Y. The illustration has been shown in the figure below.

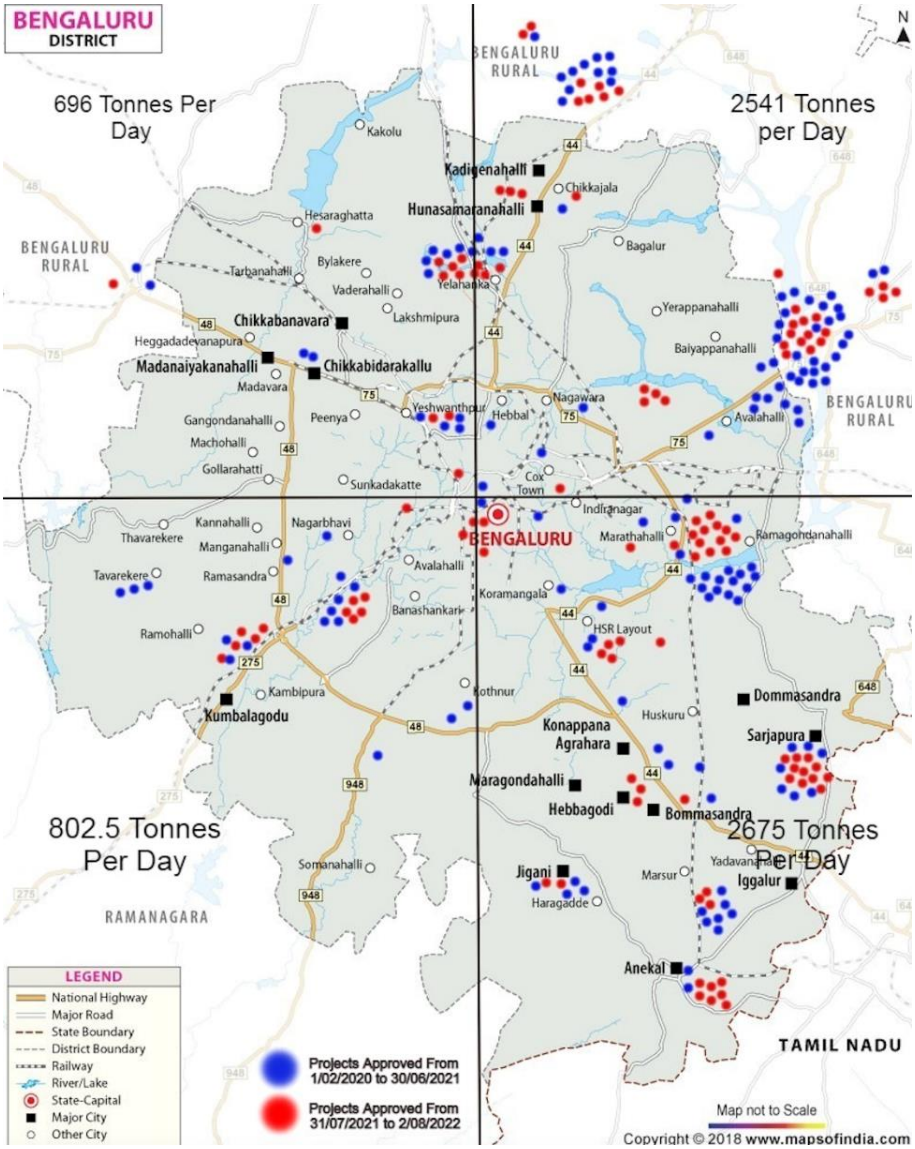


Figure 5 - Total assessed C&D waste within BMA jurisdiction

From the above table it is noted as follows:

(5) North & Northeast zone: 2541.00 TPD

(6) East and Southeast Zone: 2675.00 TPD

(7) West and Southwest Zone: 802.5. TPD

(8) West and Northwest Zone: 696.00 TPD.

There are two existing plants established to cater the north, Northeast with the capacity of two existing plant of 1750 TPD against the estimated C&D waste of 2541.00 TPD. Presently it is decided to establish a dedicated transport mechanism from these source generation spots to feed the C&D waste to the existing plants which are located almost 30.0 Km radius from the source generation spots to the corresponding existing plants at Chikkajala and Kannur.

The balance estimated quantity of (2675+802.5+696): 4173.50 TPD shall be proposed to establish the dedicated processing plants with dedicated transport mechanism. It has been decided by BSWML to establish a dedicated processing plants through PPP model by providing land to propose/establish about 4 processing plant of 500 TPD each and one plant of 1000 TPD at identified locations of:

(a) South and South East, (b) South and Southwest, (c) North and Northwest.

- The average generation of the C&D waste is about 6700 TPD based on the KSPCB assessment, but the same is not reaching to the existing destinations
- The present trucks being deployed by the unorganized sector do not have any scientific mechanism to track them.
- The truck presently operating are not meeting the emission levels causing the huge pollution to atmosphere
- Though there is a huge requirement to reuse the processed C&D waste for secondary usages there is no scientific processing being implemented and no substantial quantity is identified for reuse.
- The present C&D waste is either dumped along the storm water drains which is resulting in floods or dumped at lake beds which is resulting in damaging the flora and fauna.
- The existing truck is generating air pollution and NGT has already issued serious warnings to mitigate the pollution.
- 15^{th} finance commission under the National Clean Air Program (NCAP) is instructed to reduce the particle sizes 2.5 and 10.0 in order to improve the air quality
- The total C&D waste being assessed is about 6700 TPD which is assessed during the peak COVID-19 period hence the chances are bright that there would be a substantial increase in the generation of C&D waste.
- Considering the assessed quantity, it shall be proposed to supply about 1750 TPD to the existing two plants and about 3000 TPD shall be planned to cater to 500 TPD 4 plants and 1000 TPD 1 plant. The total proposed C&D waste shall be about 4750 TPD.
- In order to achieve the tasks, set by the NGT and 15th Finance Commission It shall be essential to establish a dedicated transportation mechanism to feed the existing two plants with the required quantity of C&D waste to run the processing plant successfully and to generate the secondary reusable materials from the processing plants
- New plants at identified locations with 500 TPD four nos and 1000 TPD one number to transport the C&D waste to these processing plants.

4.2 C&D waste processing

As is the case with municipal solid waste, proper management of C&D Waste can result in significant recovery of resources. Of the total C&D Waste generated, approximately 50-60% is easily amenable for reprocessing and these wastes include concrete, bricks and masonry fractions. The figure below describes the typical flow of C&D Waste in a well-defined waste management system. This includes flow from waste generation to disposal including all the intermediate steps/activities such as collection, processing and recycling.

All ULBs generating between 100 to 600 MT of C&D Waste per day should have at least one C&D Waste processing facility, on a stand-alone basis, which can be set by itself or through private entities. ULBs that are generating less than 100 MT of C&D Waste should explore setting up facilities on a regional/cluster basis which has the capacity to process the C&D Waste generated within their jurisdictions.

In order to minimise the environment impact, all the C&D processing/recycling facilities shall maintain a setback distance or buffer zone in line with the guidelines on setback distances (or buffer zone distance) given in CPCB Guidelines on Environmental Management of Construction & Demolition (C&D) Wastes, 2017. Local Authorities in consultation with KSPCB should prescribe buffer zone on a case-to-case basis considering all the environmental, social and economic factors. To comply with the requirements set out in the C&D Rules, CPCB guidelines and other regulations, it is recommended that a facility processing 500 MT of C&D Waste should have at least 5 acres (i.e., 20,000 square metres) of land.

(iii) As per the C&D Rules, 2016, KSPCB is required to monitor C&D Waste processing facilities at the following minimum frequency: (a) 3 times a year, i.e., once in 4 months for ULBs having a population of more than 10 lakhs; (b) 2 times a year, i.e., once in 6 months for ULBs having a population less than 10 lakhs.

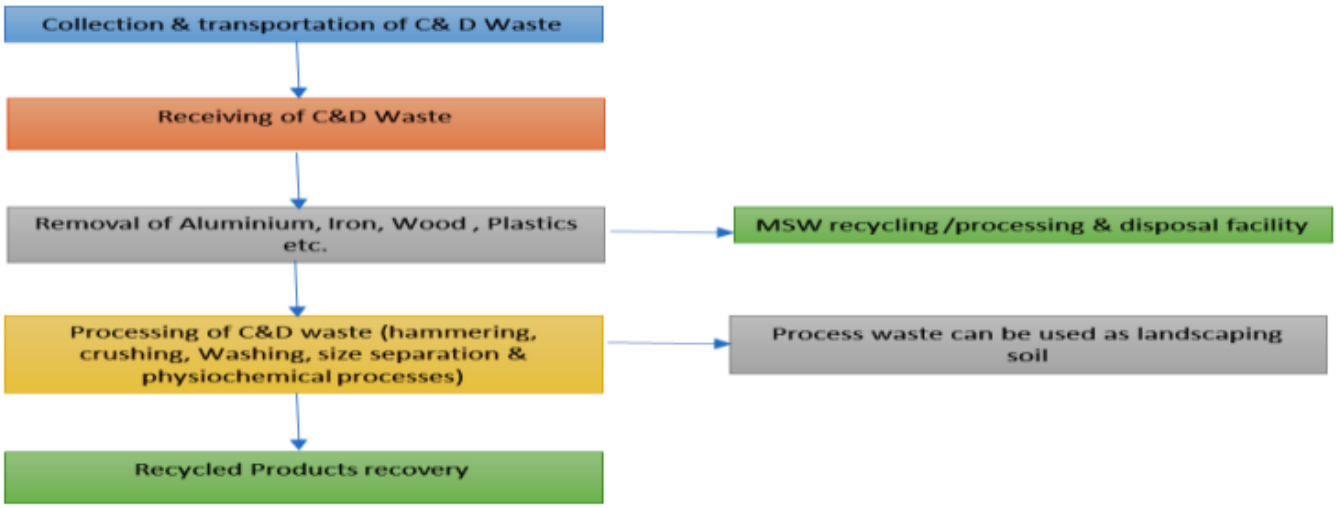

Collection & transportation of C& D Waste
Receiving of C&D Waste
Removal of Aluminium, Iron, Wood , Plastics etc.
MSW recycling /processing & disposal facility
Processing of C&D waste (hammering, crushing, Washing, size separation & physiochemical processes)
Process waste can be used as landscaping soil
Recycled Products recovery

Figure 6: Flow of C&D Waste

4.3 Process Line Description

After segregation of Rags, twigs, wood, whole bricks, plastics in a broader manner Mixed C&D Waste will be fed into the Wet Processing line

For the wet process a total set of machinery consisting of Grizzly, Vibro-Screens, hydro-cyclone, Thickener, etc that is capable of segregating sand from mixed C&D waste will be used

Lower than 60 mm fraction will go directly to the Wet Processing unit and in mechanical means it will segregate below mentioned fractions:

- Recycle Aggregate (60mm to 20 mm)

- Recycle Aggregate (20mm to 10 mm)
- Recycle Aggregate (10mm to 4.75 mm)
- Recovered Sand (-4,75mm to +75 microns)
- Fines (less than -75 microns)

Above 60 mm to 400 mm will go to the reducing units (Jaw / Granulator / Horizontal Shaft Impactor / Cone) for further size reduction and the size will be reduced to -40 mm fractions which can be used in Value added products.

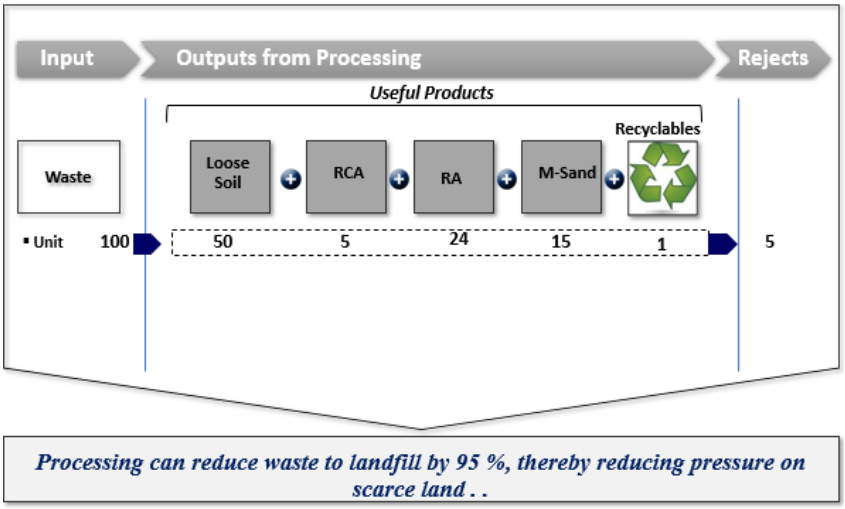


Figure 7 – Value Addition by processing

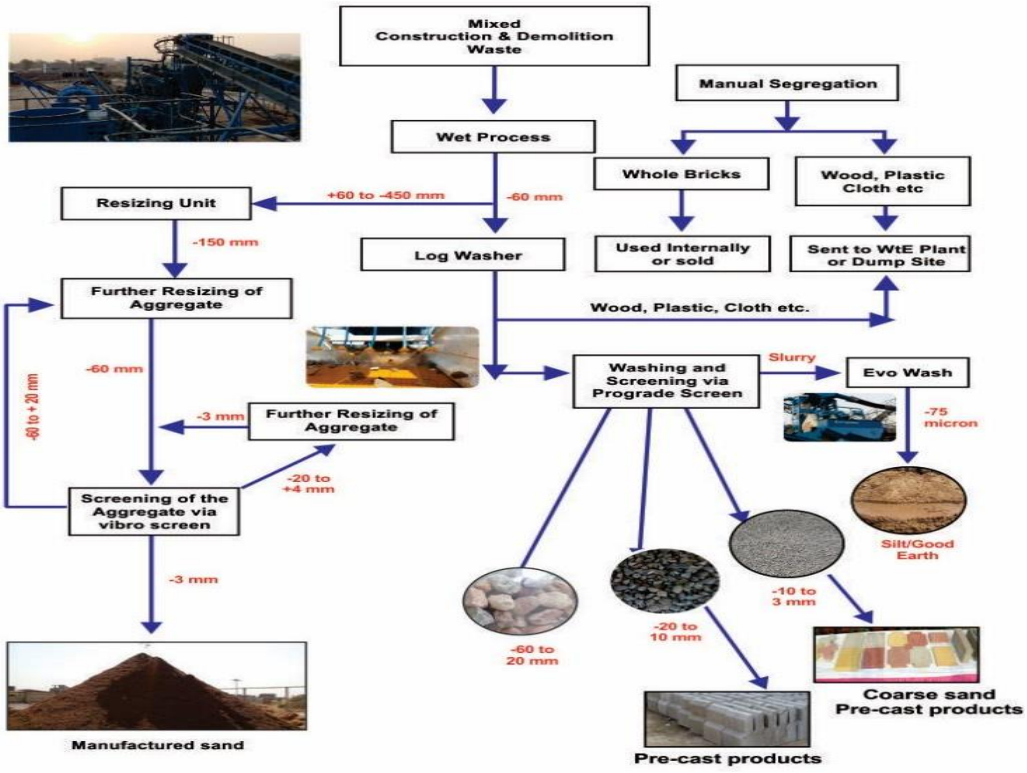


Figure 8 – Processing flow chart

4.4 Penalties

1. Historically, there have been no and/or marginal fines/penalties for non-compliance of provisions pertaining to management of any stream of municipal solid waste including C&D Waste. Even in cases where there were penalties prescribed, they were rarely enforced by the governmental authorities leading to a lackadaisical attitude among generators, staff of the Local Authorities, private players and operators of waste processing facilities with respect to compliance with applicable regulations.
2. In the above context, in order to ensure compliance with C&D Rules, ULBs should frame bye-laws for management of C&D Waste under the KMA and the KMCA and these bye-laws should include significant penalties to serve as a deterrent against non-compliance. A list of recommended fines is included as Annexure II below. Further, it is recommended that the penalties be structured as a waterfall arrangement where penalties increase proportionately for consecutive and repeated non-compliance(s) by the same person. An example of such waterfall mechanism could be twice the fine amount for the second offence and thrice the penalty amount for the third offence and finally, in case of fourth contravention, the ULB should have the power to stop the construction, demolition and/or renovation activity and/or the license issued by it to the person for carrying on business. The ULBs could also structure the penalties as a percentage of the project value and/or quantity of C&D Waste dumped in contravention of the C&D Rules. The penalty amounts should be escalated every year by a specified percentage to take into account the inflation and other costs of recovery for the ULB.

4.5 Awareness

1. Currently, there exists a lack of awareness among potential market players regarding utilisation of C&D Waste products. The Local Authority shall create a sustained system of information, education and communication for construction and demolition waste through collaboration with expert institutions and civil societies and also disseminate through their own website.
2. The Local Authority should disseminate information regarding the use and benefits of recycled C&D products among different stakeholders including members of the general public.
3. There should be a separate section on management C&D Waste on the website of the Local Authority and state government website where the information about C&D Waste including rules, policies, service charges, penalties, details of C&D Waste collection centres/transit sites and processing facilities etc are available, along with a list of suggestions for waste minimisation and an interactive section where useful ideas or experiences can be uploaded and discussed. Incentives for use of recycled material should be publicised through the website.
4. The Local Authority should use print and audio/visual media to sensitise the citizens about the issues arising out of C&D Waste being dumped at empty sites or along with other types of waste. The numbers around per day generation and the magnitude of the problem should be publicised and cooperation solicited from the citizens in handling the C&D Waste responsibly. The fact that C&D Waste is a separate waste stream and the available disposal options should be widely publicised using all the modes of mass communication available to the Local Authority. The Local Authority shall collaborate with technical experts, nongovernmental organisations and builder/developer associations to build the IEC content and disseminate the information.

CHAPTER- 5: FINANCIAL & TECHNICAL ASSESSMENT: SHALL BE ASSESSED BY BIDDER BY DULY TAKING INTO THE EXISTING SCENARIOS OF THE JURISDICTIONAL AREA OF THE PROJECT AREA

CHAPTER 6: SUMMARY AND CONCLUSION

6.1 Summary

1. Effective implementation of C&D waste collection & storage at source by all waste generators, and at all levels and scales shall be established & transportation of the same shall be provided.
2. The C&D waste management shall be processed for reuse, recycle and principles of circular economy which also emphasizes the importance of waste reduction, reuse, recovery and recycling over other forms of waste processing or management.
3. Open dumping of C&D waste is prevented with strict rules.
4. The State Government and BBMP will ensure the health, safety and dignity of every person and stakeholder involved in handling C&D waste in all respects.
5. Bengaluru, like other cities is facing problems due to old dump yards situated close to the expanding cities. These dump yards need to be reclaimed for developing the city's infrastructure. This is the case for many cities in India with an alarming rate of urbanization process. Also, these create a nuisance in the town, and the same needs to be stabilized or reclaimed. The waste sites that were earlier in the periphery of the corporation limits of Bengaluru City are now in the development zone of a more magnificent Bengaluru City,
6. It can be seen from a satellite image that the built-up area has come near and around the earlier dump sites. Thus, it is clear that most of the old dumpsites which are existing around Bengaluru have become potential places for development.
7. All the existing dumps need to be rehabilitated, remediated, maintained and monitored over a long period to ensure better environmental parameters meet the standards.

6.2 Proposed Objectives of work

The scope of the Project shall mean and include, during the Concession Period, the Design, Build, Finance, Operate, and Transfer (DBFOT) of facilities of C&D waste management and infrastructure for:

1. Source collection of CDW;
2. Primary transportation of collected CDW to Transfer station;
3. Secondary of CDW from Transfer station to processing facility;
4. Design, Construction and operation & maintenance of CDW processing facilities
5. Disposal of Residual Inert Matters
6. Collection of user charges from the Source generators as levied by the BSWML.
7. Performance and fulfillment of all other obligations of the Concessionaire in accordance with the provisions of this Agreement and matters incidental thereto or necessary for the performance of any or all of the obligations of the Concessionaire under this Agreement.
8. Project Facilities: The Concessionaire shall construct the Project Facilities by the provisions of this Agreement including the Background Documents
9. Any other activity which the government may by Act declare/notify to be undertaken for C&D waste management
10. The scope of the Project shall also include any other activities that are auxiliary to the above-mentioned scope of the Project.

11. Background documents shall form part of the Scope of the project.
    - Estimated amount towards vehicles of 7.5T GVW hook loader of 73 nos. with Containers 924 and 28 T GVW of 65 nos, with Containers of 231 and Estimated Tipping fee is Rs. 764.92 for 30 KM Radius.
    - The RFP based on NITI AAYOG standard Documents along with Model Concessionaire agreement is proposed to call under two independent packages shall be called as follows:

    The RFP proposed to call for the capital investment of the 210.54 Crores to be borne by the concessionaire from their own financial arrangements by the bidders and O&M expenses for the period of 15 years on PPP model with 100% capital and O&M expenses shall be borne by the Concessionaire on their own and approved tipping fee shall be paid by BSWML to the concessionaire on monthly basis as per the payment schedule indicated in the DCA.

6.3 Assumptions to be adopted by intending bidders: Based on the scope of work and objectives, the following assumptions have to be adopted:

1) Assessment of the construction facilities and demolition activities within BBMP and Bengaluru urban district.
2) The capacity of the vehicles for the primary transportation is to be at 7.5 T GVW capacity hook loaders or any other suitable size and capacity as per the norms.
3) The secondary transportation has been at 28T to taken up with large-size containers which can be carried by GVW Hook loaders.
4) There are 30 divisions within the jurisdiction and it is proposed to have equal requirement of vehicles per 1 division.
5) The C&D Waste collection and transportation vehicles shall cover the area of BMMP and Bengaluru Urban district.

Table 6 – Vehicle assessment details

S No.	Item Description	Capacity	Quantity
1	**Primary Transportation** **A)** Hook Loaders **B)** Containers	7.5 T GVW 5 cum	73 924
2	**Secondary Transportation** A) Hook Loaders B) Containers	28 T GVW 20 cum	 65 231

6.4 Recommendations

1. Proposed to call the RFP to appoint the Concessionaire for a concessionaire period of 15 years on PPP model with 100% Concessionaire investment on capital cost of Rs. 210.54 Crores and O&M cost of Rs. 1,555.02 crores for 15 years by the bidder
2. The BSWML shall establish the Escrow account and collect the cess from the construction activities through BESCOM based on per sq.km. based on per sqm. Basis of plan section for modification /alteration/ renovation/new construction activities.
3. The processing fee shall be paid by BSWML from ESCROW Account to the Concessionaire. The assessed processing fee is only for reference purposes.

Table 7: Standards for Aggregates and utilisation

C&D waste BIS IS: 383	Plain Concrete	Reinforced Concrete	Lean Concrete (< M15 grade)	Extent of Utilisation
Recycled Concrete Aggregate (RCA)	25%	20% (only upto M25 grade)	100%	as Coarse Aggregate
Recycled Aggregate (RA)	Nil	Nil	100%	as Coarse Aggregate
Recycled Concrete Aggregate (RCA)	25%	20% (only upto M25 grade)	100%	as Fine Aggregate

Table 8: Storage area size estimation table

Built up area of construction	Minimum Size of storage area for C&D waste (sq.ft)
<5000 sqft	82
5001-15,000 sqft	125
15001-50,000 sqft	175
50,000 – 100,000 sqft	225
100,001 – 200,000 sqft	275
>200001 sqft	500

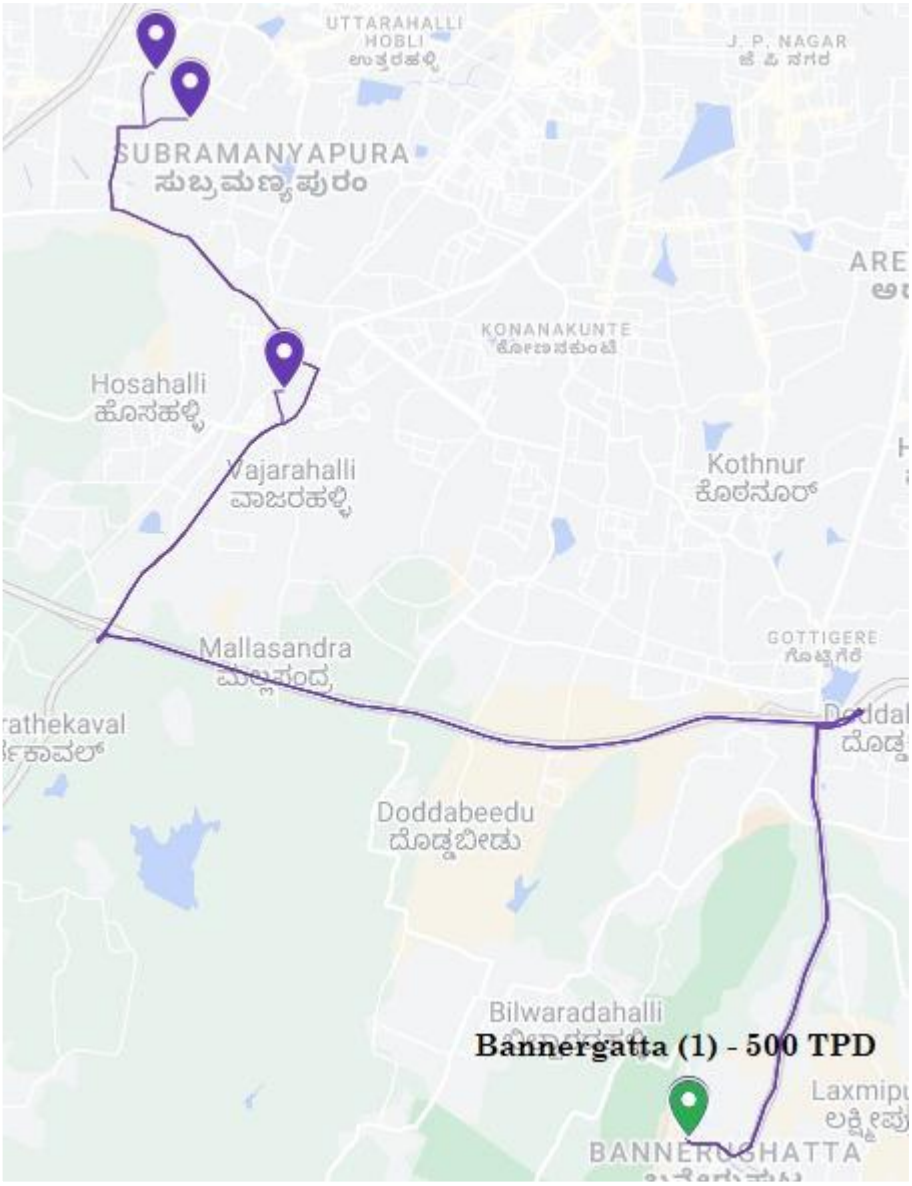
Table 9: Table of Materials, Process and End Products

Material	Process	End-Use
Concrete	Crushed and mixed Crushed and screened	New cement blocks
Dirt	Sorted	Landscaping/Landfill cover
Reinforced concrete	Crush sorted, and steel bar removed. Steel recycled.	Crushed, sorted aggregate. For recycling
Clay bricks and roof tiles	Cleaned, Crushed and sorted. Pulverised	Reused for masonry Aggregate Mixed with lime to produce mortar
Calcium silicate bricks	Cleaned Crushed Pulverised	Reused for masonry Aggregate Recycled into new Calcium Silicate bricks
Natural stone masonry	Cleaned Crushed	Reused for masonry Aggregate
Natural stone slabs	Cleaned, Crushed	Flooring, cladding, aggregate
Ceramic Tiles	Cleaned, Crushed	Flooring, cladding, aggregate
Asphalt Paving	Crushed and cold mixed Crushed and hot mixed	Road construction excluding wearing course
Mixed demolition waste	Crushed	Fill material
Steel	Cleaned Recycled	Reused steel components New steel components
Aluminium	Cleaned Recycled	Aluminium recycled streams
Timber beams, doors	Cleaned	Reused as shuttering and other products Feedback for engineered woods
Plastics	Recycled	Plastic recycling stream
Gypsum plasterboard	Cleaned Crushed Recycled	Reuse as boards Soil conditioners New gypsum products
Glass	Cleaned Crushed Recycled	Glass recycling streams

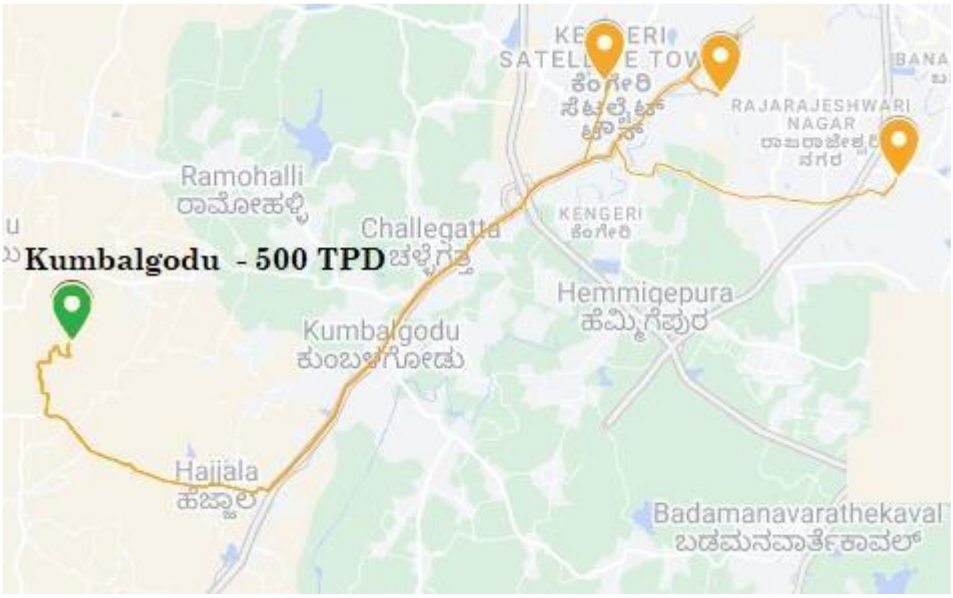
CHAPTER 7: LIST OF ANNEXURES

Annexure 1: Route Map for vehicle movement from Transfer Stations to Processing Plant

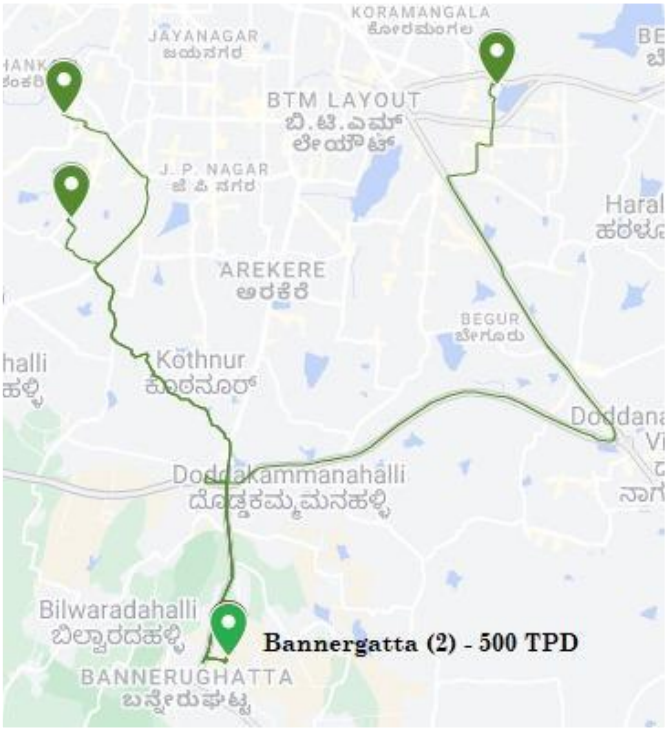
A. Bannergatta(1) Processing Unit



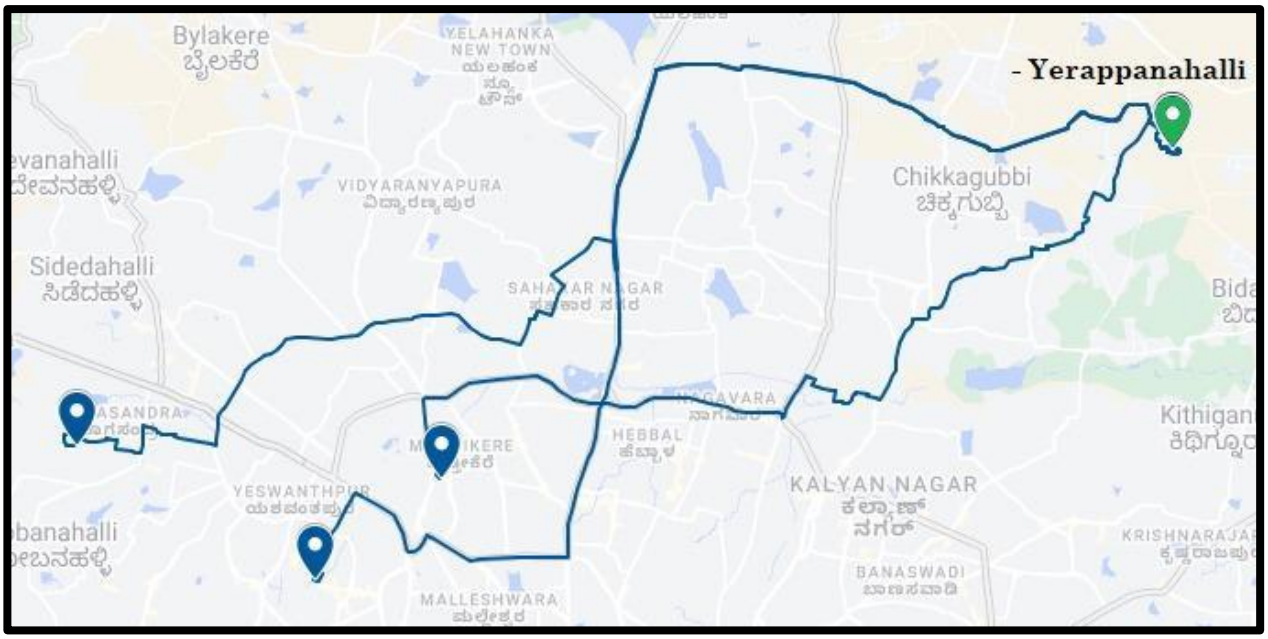
B. Kumbalgodu Processing Unit



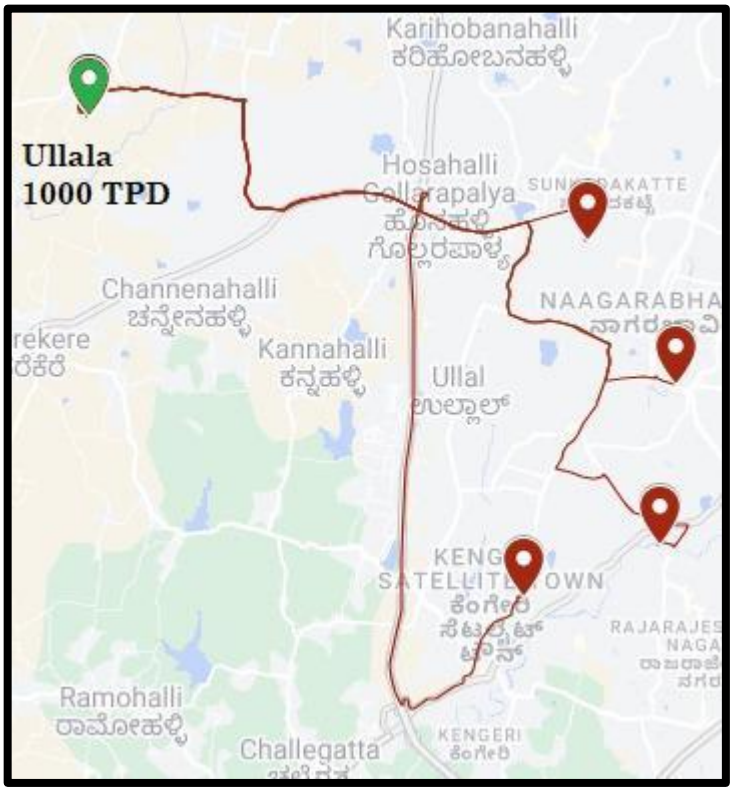
C. Bannergatta(2) Processing Unit



D. Yerappanahalli Processing Unit

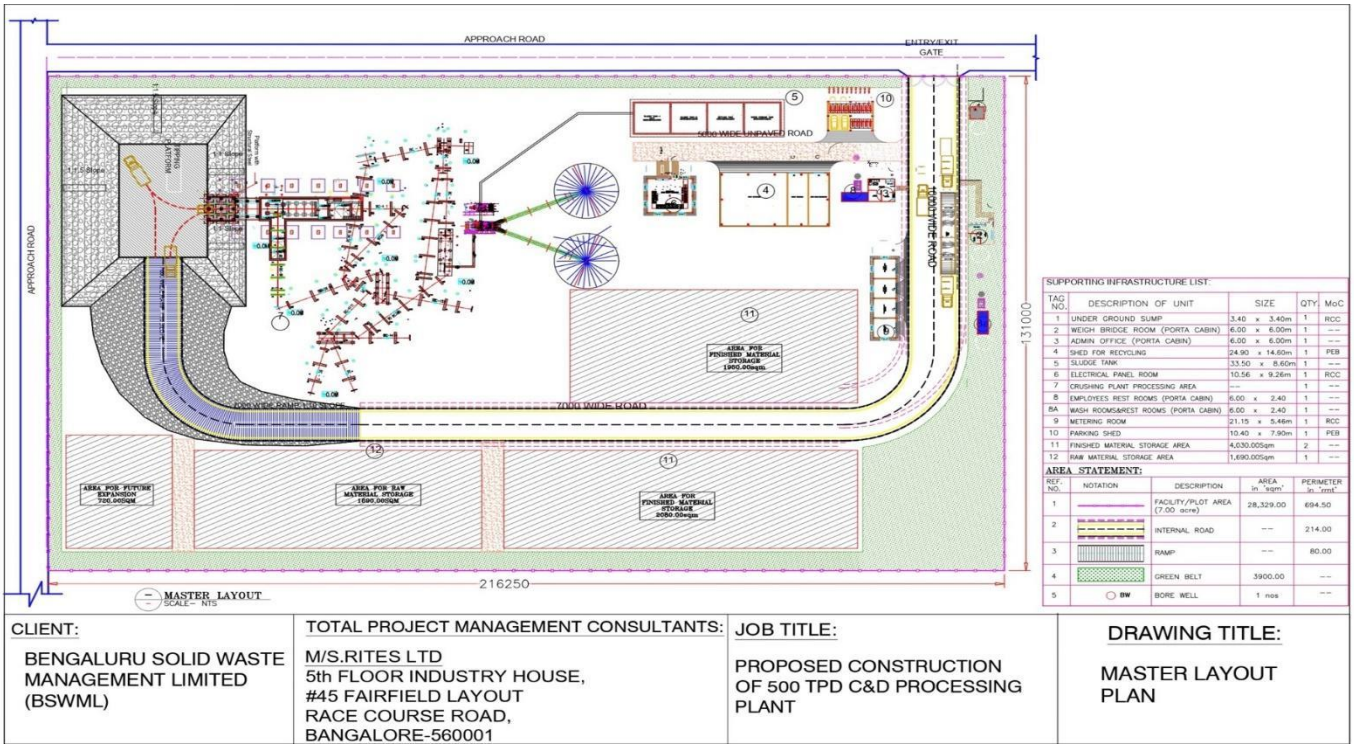


E. Ullala Processing Unit

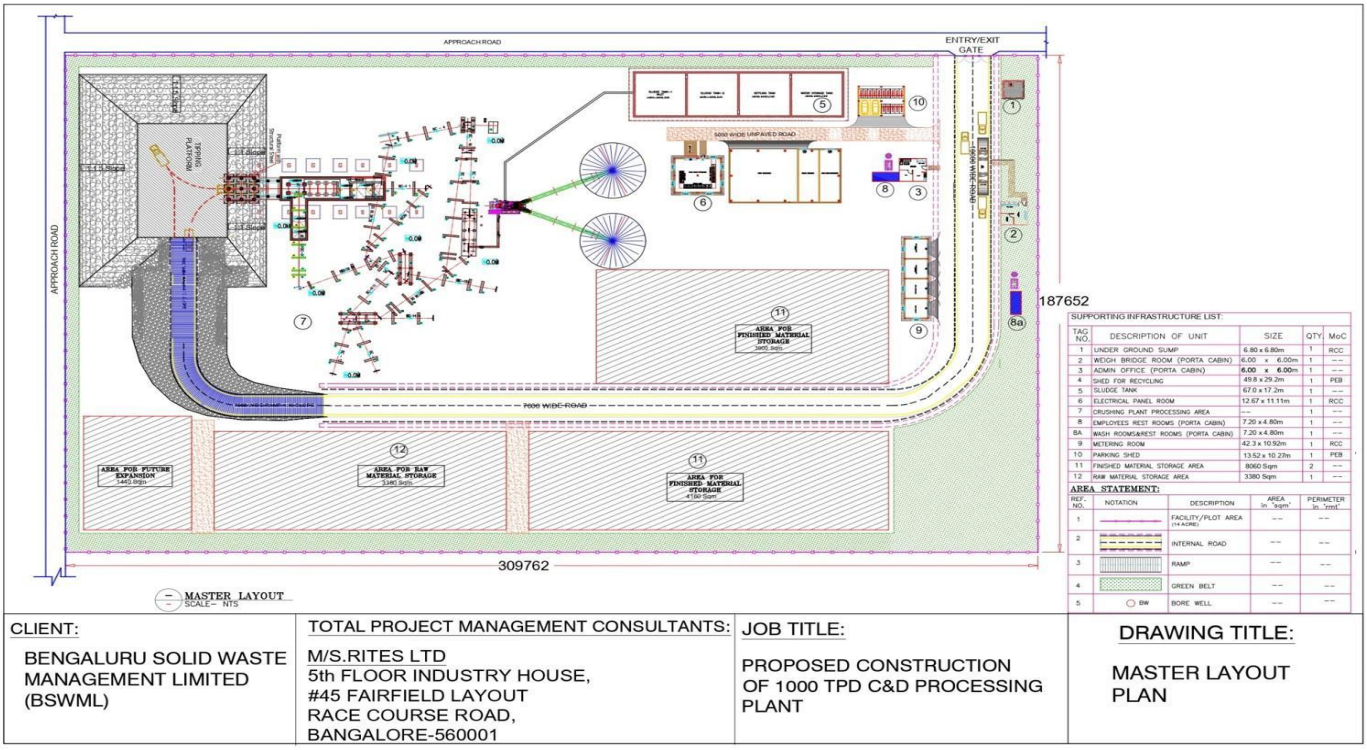


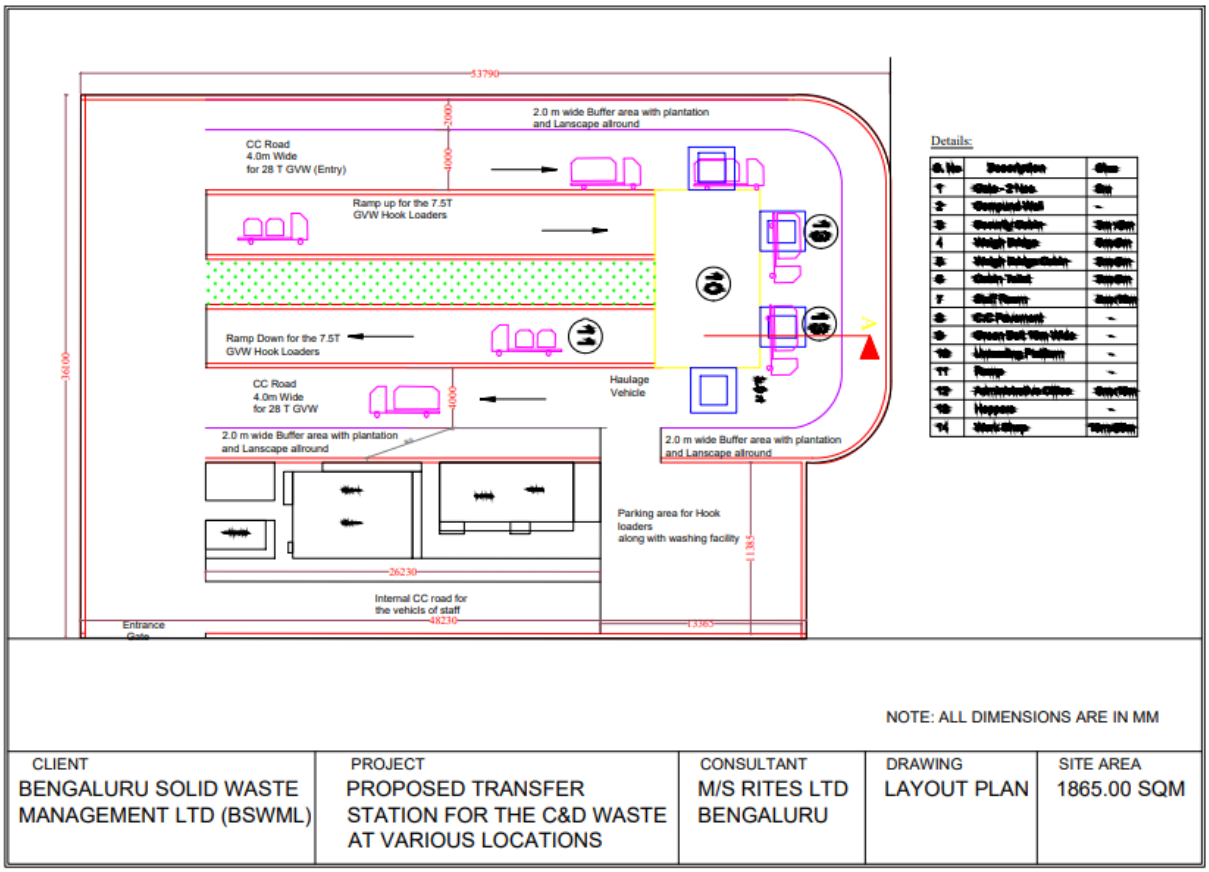
Annexure– 2: Layout plan for processing plants

500 TPD



1000 TPD




53790
2.0 m wide Buffer area with plantation and Lanscape allround
CC Road 4.0m Wide for 28 T GVW (Entry)
3000
4000
Ramp up for the 7.5T GVW Hook Loaders
Ramp Down for the 7.5T GVW Hook Loaders
CC Road 4.0m Wide for 28 T GVW
4000
Haulage Vehicle
2.0 m wide Buffer area with plantation and Lanscape allround
2.0 m wide Buffer area with plantation and Lanscape allround
Parking area for Hook loaders along with washing facility
1385
26230
Internal CC road for the vehicls of staff
48230
13363
Entrance Gate
16100
Details:
NOTE: ALL DIMENSIONS ARE IN MM
CLIENT
BENGALURU SOLID WASTE MANAGEMENT LTD (BSWML)
PROJECT
PROPOSED TRANSFER STATION FOR THE C&D WASTE AT VARIOUS LOCATIONS
CONSULTANT
M/S RITES LTD BENGALURU
DRAWING
LAYOUT PLAN
SITE AREA
1865.00 SQM

Annexure– 3: C&D Waste Materials Checklist The following checklist template will be useful when planning to salvage, reuse and recycle demolition materials

Demolition Materials	Comments and Concerns
Air conditioning equipment 1. Computer room packages 2. Mini central systems 3. Window units	CFC
Aluminium: Handrails, other Appliances, white goods	Testing, removal
Asbestos Containing Materials: Insulation, floor and ceiling tile, floor and wall coverings, roofing felt and shingles, wall board, siding, ductwork, adhesives, caulking, putties, taping and speckling compounds.	
Asphalt: Paving Asphalt: Shingles Batteries	
Brass Brick Bronze Cabinets	
Cable: Various Cardboard	
Carpet, padding and backing Cast iron: Radiators, pipes, other Clay tile blocks	
Compressors	
Concrete masonry units Decking: Wood	
Door frames: 1. Wood, metal 2. Heavy vault 3. Thin panel and various Wood, Metal	Non-rated
Ductwork Earth	
Electric switchgear, feeder cables, conduit	
Electrical: Cable, Elevator cabs, machinery, shaft equipment, rails Fabric	PCB
Fiberglass	
Fire suppression equipment Fixtures & fittings: Plumbing Fixtures: Electrical	
Flooring: Carpet Flooring, Wood Fuel storage tanks	
Furniture: Wood, Metal Furniture: Reusable Furniture	Can be re-manufactured
Glass: Interior and exterior, Plate, Wired, laminated	

Glazing compound: Asbestos, lead possible Testing Gutters and flashing	Testing
Gypsum blocks Gypsum board	
Hardwood Hazardous materials Heavy timbers	ACBM
Insulation	
Light fixtures: Decorative, Fluorescent and utility fixtures, Vintage fluorescent, incandescent, Lamps: Fluorescent	Mercury retrieval
Lead: Paint, Roofing, Flashing, Piping Light bulbs	Testing, removal
Marble: Toilet partitions, Walls	
Metal: Brass, Bronze, Cable, Cast-iron, Conduit, Copper	PCB Ballasts
Partitions, demountable panels Partitions: aluminium tracks, miscellaneous framing	
Mirrors	
Paper	

Annexure-4: Volume to Weight Conversion

Materials:	Volume *	Weight in Pounds *
MIXED MUNICIPAL SOLID WASTE (MSW)		
MSW, (uncompacted)	One cubic yard	150-300 (225 Average)
MSW, (compacted in truck)	One cubic yard	500-1,000
MSW, compacted in packer truck	3.3 cubic yards	2000 (Average)
C & D; Clean Fill		
Concrete	One cubic yard	860
Asphalt Paving	One cubic yard	773
Brick, Ceramic, Porcelain	One cubic yard	860
Roofing	One cubic yard	731
Wood	One cubic yard	169

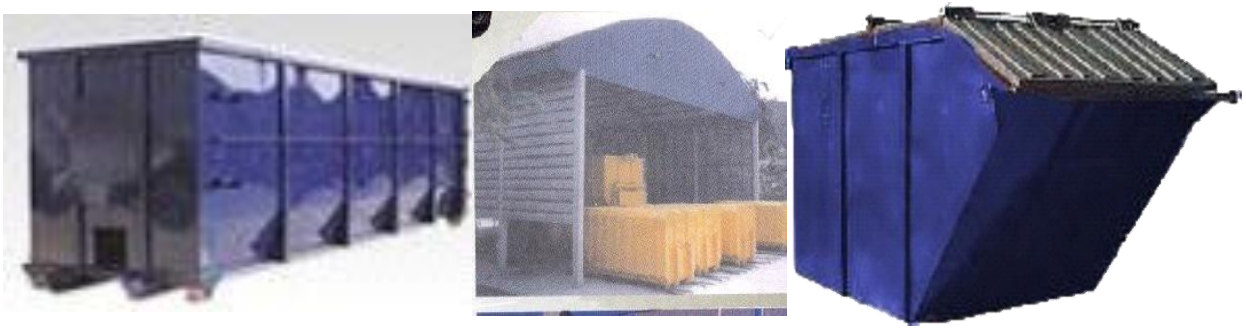
Annexure-5: Specifications of typical containers to be used for storing C&D WASTE

	Model	
Container Specification	Hook Loader	Dumper Placer
Container Type	Closed	Closed
Volume (m3)#	9 & 12-16	1.5*, 2.5-3.5**, 4.5-5***
Material Of Construction	Commercial Mild Steel of Appropriate IS specification (Not less than 3mm for walls/sides and not less than 4mm for floor/bottom)	
Recommended Chassis	16-25 T GVW	7*, 9**, 12*** T GVW
Lifting Arrangement	Rear lifting	Rear lifting

#Dimensions of the containers to adhere to the RTO norms. Total loading not to exceed 25 tonnes GVW. The containers shall have an integral securement system to ensure that the rear end of the container is well secured with the vehicle chassis.

Annexure- 6: Illustrative Pictures of Different Containers & Vehicles

Typical Containers



Typical Hook Lifts

Typical Dumper Placers

ANNEXURE – 7: Quantity Estimation of C&D Waste

Quantity Estimation of C&D Waste:

The following formulae can be used to estimate the quantity of C&D Waste

Formula: A x Gave x 0.000454 = Qp

Where,

A=Project Area (Square Foot)

Gave=Weighted Average Generation Rate (Refer below Table)
Qp = Total Project C&D Waste

0.000454 = Conversion Factor from lbs to tons

Weighted Average C&D Waste Generation Rates

S.No	Type	Residential (lbs/sq.ft)	Non-Residential (lbs/sq.ft)
1.	New Construction	4.38	3.89
2.	Renovation	Varies	17.67
3.	Demolition	115.00	155.00

(Source: Franklin Associates, "Characterization of Building-Related Construction and Demolition Debris in the United States," U.S. Environmental Protection Agency, Jun. 98, p. 2-2, 2-3, 2-6, 2-7, 2-8, 2-9, 2-10, and A-5.)

Annexure-8: C & D WASTE by physical verification at unauthorized dumpsites and Construction & Demolition sites in Bengaluru City

Sl No	NAME OF THE LOCATIONS	NO.OF SPOTS
1	ORR from Guruguntapalya to Nayandahalli	20
2	Tumkur road from sangolli rayanna Circle to 8 mile	6
3	You are from gundu Guntur palya to batrahalli	34
4	Magadi road	10
5	West of chord road	10
6	Allessandra kogilo Kannur road	12
7	Hennur Main Road	6
8	BEL Signal to Doddaballapura Road	4
9	Kommaghatta Road`	2
10	Somanahalli - Mughulpalya	4
11	Bedarahalli – Ullal Road	2
12	Hegganahalli Main Road	6
13	Ring Road – Kanteerava Studio Mani Road – MEI Road	2
14	Pipeline Road	6
15	Bengaluru University Road	2
16	Ramanagondanahalli	10
17	Hesaraghatta Road	2
18	HMT Road	6
19	Ganigarahalli Main Road	10
20	Thanisandra Main Road	2
21	MEI Main Road	2
22	GKVK Road	2

23	Nadaprabhu Kempegowda Main Road	2
24	Attur Layout Road	2
25	Ramachandrapura Main Road	2
26	Kachohalli – Gangondanahalli – Dombarahalli Road	4
27	Andhrahalli Main Road	4
28	Pipeline Road from Goruguntapalya to Hesaraghatta Road	4
29	OMR from KP Puram to Chamasandra	30
30	ORR from KP Puram to Silk Road	18
31	OMR link 2 from KP Puram to Hoodi Junction	14
32	OMR link 1 Trinity Circle to Benniganahalli	36
33	Swami Vivekananda Road	4
34	Old Airport Road	26
35	Suranjan Das Road	24
36	Indiranagar 80 feet Road	16
37	CMH Road	14
38	Paramahansa Yogananda Road	14
39	Hal Wind Tunnel Road – Belur Yemlur Road	4
40	Hoodi - Hal	16
41	Nallurahalli Main Road	8
42	ITPC Jain school to Whitefeild	6
43	Kensington Road	6
44	Queens Road	2
45	Venkataswamy Naidu Road	4
46	Commercial Street Road	8

47	Rmamurthy Nagar – TC palya	8
48	ULSOOR lake Road	6
49	St. John Church Road	4
50	KR Puram Police station road	10
51	Ramamurthy Nagar Kempegowda underpass	2
52	Ramamurthy Nagar Main Road (Bridge)	4
53	Kasturi Nagar Main Road	6
54	Assaye Road	2
55	Byrathi Bilishivale Main Road	10
56	Kalkere to Rammurthynagar	4
57	Kodigehalli Main Road	6
58	ORR from Nayandahalli Junction to Silk Board	10
59	Mysore Road from Hudson circle to Nice Road Junction	16
60	Kanakpura Road from Nice Road Junction to KIMS Hospital	12
61	Bannerghatta Road to Anepalya Junction to Nice Road	22
62	Hosur Road from Silk Board to Electronic City Nice Road Junction	14
63	Intermediate Ring Road from Hosur Road to OMR VIA Ejipura	20
64	Gandhi Marg from Jnanabharathi to KVRV Road 5th Main (Magadi Road)	2
65	New BEL Road from CV Raman Main Road to Kuvempu circle	6
66	Hennur Main Road from Hennur cross to Frazer Town	8
67	MM Road from Frazer town to wheeler Road	4
68	Millers Road from Bengaluru from Cantonment to Halsur lake	4
69	Sankey Road from Yeshwantpur Bus Station Kaveri Theater	6

70	Dr. Rajagopal Road to kodigehalli Main Road Via Sanjaynagar Main Road	6
71	Subroto Mukherjee Road from Jalahalli Cross to BEL Junction	2
72	Dr Vishnuvardhan Road to Kengeri Bus terminal to Vishnuvardhan Circle (Uttarahalli)	10
73	Dr Vishnuvardhan Road from Vishnuvardhan Circle (Uttarahalli) to Benniganahalli Metro Station	4
74	100 ft Road Turahalli forest from Gattige Palya to Banashankari 6ht Stage	6
75	Kumaraswamy temple Road to HD Deve Gowda Circle Verabhadra Nagar	2
76	Ullal crossto Nice Road	4
77	Basaveshwara Nagar Main Road Havanur Circle to West of Chord Road	10
78	Ambalipura to Sarjapur Road from Sarjapur to muthanallur Cross	12
79	Banashankari Bus Stop to Madiwala Ayyappa swamy temple Road	10
80	Gottigere Main Road	2
81	Ullal Bridge to Kengeri satellite town	6
82	Ullal flyover to Magadi Road via Sunkadakatte	10
83	Shivajinagar (Thimmaiah Road)	2
84	Shivaji Nagar (Old poor house road)	2
85	Shivajinagar (cock burn road)	8
86	Shivajinagar (Dasappa Colony)	2
87	Halasur lake	10

Annexure- 9: Estimation of CDW from Construction Projects in Bengaluru

C&D WASTE DATA from 01.01.2020 to 28.06.2021

Sl. No.	Name & Address of the Projects	Type Of Project	Built Up Area in Sq.m	ACRES
1	M/s. Arvind Smartspaces Ltd., located at Yelahanka Hobli, Bengaluru North Taluk, Bengaluru.	Residential Apartment	57,062.78	
2	M/s. S.V. Housing in the name of "S.V. Grandur" located at Kammasandra Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	41,343.32	
3	M/s. V Group (Residential Apartment) located at , Kowdenahalli Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	21,838.96	
4	M/s. S.S.P Garden City located at Cowdalli Village, Kollegal Taluk, Chamarajanagar District.	Residential Layout	0	32.35
5	M/s. Prestige Estates Projects Ltd., located at Pattandur Agrahara Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	1,70,752.88	
6	M/s IBC Knowledge Park, located at Bannerghatta Road, Uttarahalli Hobli, Bengaluru South Taluk, Byrasandra, Bengaluru.	Hotel/Office (Block - G)	65040.59	
7	M/s Prithvi Developers located at Varthur Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	34,749.60	
8	M/s Metro Cash and Carry India Private Limited., located Industrial Suburbs, Subramanyanagar, Yeshwanthpur, Bengaluru.	Commercial Building	1,77,470.03	
9	M/s. Adarsh Haven Pvt Ltd., located at Gasthikempanahalli Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru Urban District.	Residential Apartment	4,13,164.59	
10	M/s. Sumadhura Homes LLP (Residential Apartment) in the name of "Sumadhura Asphire" located Doddabanahalli Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru Urban District.	Residential Apartment	36,302.65	
11	Sri. Venkateshwara Industrial LLP located at Electronic City 2nd Phase Industrial Area within the Village limits of Konnappana Agrahara, Begur Hobli, Bengaluru South Taluk.	Commercial Building project	1,49,000.03	
12	M/s. Embassy Construction Pvt Ltd., Venkatala Village, Yelahanka Hobli, Bengaluru Urban District, Bengaluru.	"Embassy Business Hub" Commercial Development Projects	88,270.15	
13	Dr D. Premachandra Sagar located at Devarakaggalahalli Village, Harohalli Hobli, Kanakapura Taluk, Ramanagara District.	Hostel Building	56,353.68	
14	M/s. Adarsh Developers located at Gattihalli Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	6,54,472.72	

15	Smt. Nagamma & Anoop N Patel (A.A. Builders & Developers) located at Anupinakate Village, Kasaba Hobli, Shivamogga Taluk & District.	Residential Layout		20.14
16	M/s. Eco Life Developers located at Balagere Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	65,516.37	
17	M/s. Felicity Adobe LLP (Formerly Known as Tumkur Nivas LLP) located at Arabikottanoor Village, Vakkaleri Hobli, Kolar Taluk & District.	Residential Apartment	32,331.52	
18	M/s. Akarshak Reality Pvt Ltd., located at Gattihalli Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	5,67,998.20	
19	M/s. Bagmane Developers Pvt Ltd., in the name of "Bagmane Taurus – 3" located at Sy. No. 58 & 59 of Doddenakundi Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Commercial Complex for Office/IT	84,996.02	
20	M/s. Panchajanya Vidya Peeta (PVP) Welfare Trust (Reg.,) Dr. Ambedkar Insitute of Technology located Mallathalli Village, Outer Ring Road, Bengaluru North Taluk, Bengaluru.	Installation of STP to the existing building (Institution Building)	36,000	
21	M/s. Bagmane Developers Pvt Ltd., in the name of "Bagmane Capital" located at Mahadevapura Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru Urban District, Bengaluru.	Commercial Building	9,20,843.63	
22	M/s. Radiant Kaira located at Kammasandra Agrahara Village, Kasaba Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	29,573.44	
23	M/s. Golf Links Software Pvt Ltd., located at Challaghatta Village, Off Intermediate Ring Road, Bengaluru.	Existing STP's from FBR Technology		
24	M/s. Christ University located Dharmaram College, Hosur Road, Bengaluru South Taluk, Bengaluru.	Educational Institute	11,342.56	
25	M/s. Bengaluru Development Authority (BDA) located at Konadasapura Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	83,665.15	
26	M/s. Casa Grande Garden City Builders Pvt Ltd., located at Geddalahalli Village & Thanisandra Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	61,687.78	
27	M/s. DSR Infrastructure Pvt Ltd., located at Bidare Agrahara Village and Doddabanahalli Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru Urban District, Bengaluru.	Residential Layout	78,179.56	
28	M/s. S.V. Infra Holdings Limited located at Khatha No. 3255, Sy. No. 38, Pattandur Agrahara Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Commercial/Residential Apartment	45,792.23	
29	M/s. Expert Investment Pvt Ltd., located atBukkasagara Village, Jigani Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Layout		21.29

30	M/s. Surya Projects located at Channasandra Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru Urban District.	Residential Apartment	41,867.15	
31	M/s. APG Industrial Conglomerate Pvt Ltd., located Hitech Defence & Aerospace Park, Devanahalli Taluk, Bengaluru Rural District, Bengaluru.	New Warehouse Building	1,05,463.83	
32	M/s. MVN Infrastructure Pvt Ltd., located at Rayasandra Village, Kasaba Hobli, Devanahalli Taluk, Bengaluru Rural District, Bengaluru.	Residential Apartment	58,208.63	
33	M/s. Manipal Academy of Higher Education Trust located at Vasudevapura Village and Govindapura Village & Kenchanahalli Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru.	Construction of Academic Building & Hostel Block	1,44,587.83	
34	M/s. Ahad Builders Pvt Ltd., located at Rayasandra Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	99,957.83	
35	M/s. Desai Developers located at Seeghehalli Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	44,324.82	
36	M/s. Mac Charles (India) Ltd., located at Vasanthanagar, Bengaluru – 560 052.	Commercial Building	64,657.40	
37	M/s. Munawar Burhan located at Geddalahalli Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengluru.	Residential Apartment	38,222.21	
38	M/s. Bagmane Developers Pvt Ltd., in the name of "Bagmane WTC Opal" located at Mahadevapura Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Commercial Building	93,417.24	
39	M/s. Bagmane Developers Pvt Ltd., located at Mahadevapura Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru Urban District, Bengaluru.	Commercial Building	2,20,724.19	
40	M/s. United Developers located at Nagondanahalli Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	37,764.47	
41	M/s. Gazy Mag Pvt Ltd., located at Chikkagubbi Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	80,237.66	
42	M/s. Green Nesto Builders & Developers located at Chikkanayakanahalli Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	33,546.76	
43	M/s. Manjeera Constructions located at Allalasandra Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru.	Residential Apartment	82,025.05	
44	M/s. Urban Space Projects Pvt Ltd., & Others C/o Sobha Limited located at Yadavanahalli Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	1,13,100.34	
45	M/s. Sap Labs India Pvt Ltd., located at KIADB, Export Promotion Industrial Park, Whitefield Road, Bengaluru.	IT/ITES Office Building	79,827.08	

46	M/s. Project Seabird Phase II A, Karwar Naval Base DDGPI, PIMT Office, Naval Base, Arga Village, Karwar Taluk, Uttar Kannnada District.	Naval Base Project		
47	M/s. Expert Investment Pvt Ltd., located at Bukkasagara Village, Jigani Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	19,992.83	
48	M/s. Godrej Projects North Star LLP located at Chikkasanne Village, Kasaba Hobli, Devanahalli Taluk, Bengaluru Rural District.	Residential Apartment	1,35,031.66	
49	M/s. Sri Sai Associates located at Kaggalipura Village, Uttarahalli Hobli, Bengaluru South Taluk, Bengaluru Urban District.	Residential Apartment	66,259.76	
50	M/s. United Infrastructure located at Ammani Bellandur Khane Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	31,590.93	
51	M/s. M. Chandrashekar located at Kithaganur Village, Bidarahalli Hobli, Bengaluru.	Residential Apartment	62,050.27	
52	M/s. 2Getherments Infra Pvt Ltd., located at Khatha No. 866, Hoodi Village, K.R. Puram, Bengaluru.	Residential Apartment	55,979.85	
53	M/s. Sai Raghavendra Constructions & Development located at Pattandur Agrahara Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	40,675.03	
54	M/s. Krishna E Campus Pvt Ltd., located at Ambalipura Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment and Commercial Space	86,840.12	
55	M/s. Shreshta Infra Projects Pvt Ltd., located at Hegganahalli Village, Kundana Hobli, Devanahalli Taluk, Bengaluru Rural District.	Residential Layout	4,01,598.30	
56	M/s. Shreshta Infra Projects Pvt Ltd., Phase – II located at Bettanahalli Village, Kundana Hobli, Devanahalli Taluk, Bengaluru Rural District.	Residential Layout	1,70,675.48	
57	M/s. G.R. Construction located at Rayasandra Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	41,026.42	
58	M/s. M.R. Group located at Singasandra Village, Begur Hobli, Bengaluru.	Residential Apartment	30,651.88	
59	M/s. Century Star located atAttur Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru.	Residential Apartment	83,561.87	
60	M/s. Total Environment Constructions Pvt Ltd., in the name of "In That Quite Earth (ITQE) located at Bileshivale Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	4,55,743.32	
61	M/s. Global Edifice Builders located at Iggalur Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District, Bengaluru	Residential Apartment	40,336.67	
62	M/s. Greenfinch Projects Pvt. Ltd., located at Chikkanhalli Village, Attibele Hobli, Anekal Taluk, Bangalore Urban District	Residential Apartment	31,741.75	
63	M/s. Puravankara Ltd., located at K.R. Puram Hobli, Old Madras Road, Bengaluru East Taluk, Bengaluru.	Commercial Building	1,20,339.81	

64	M/s. Klassik Enterprises in the name of "Klassik Landmark" located at Junnasandra Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	1,33,718.17	
65	M/s. Sobha Limited located at Hagadur Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	1,74,393.68	
66	M/s. Suguna Builders & Developers located at Haligevaderahalli Village, BBMP Rajarajeshwarinagar Zone & Ward (160), Kengeri Hobli, Bengaluru South Taluk, Bengaluru Urban District, Bengaluru.	Residential Apartment	32,371.29	
67	M/s. Taj Gvk Hotels & Resorts Ltd., located at Shivanahalli Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru.	Hotel Rooms	38,199.52	
68	M/s. Mythri Builders located at Kodathi Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	56,734.61	
69	M/s. Indus Valley Homes Pvt Ltd., located at Bellandur Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	70,169.48	
70	Sri. Balaji Builders located at Kodigehalli Village, K.R. Puram Hobli, Bengaluru.	Residential Apartment	29,065.13	
71	M/s. Vaishnavi Infrastructure Pvt Ltd., in the name of "Vaishnavi Vintage" located atDoresani Palya, Bilekhalli, Begur Hobli, Bengaluru South Taluk, Bengaluru.	Commercial Building	55602.07	
72	M/s. Brigade Enterprises located at Chikkalasandra Village, Uttarahalli Hobli, Subramanyapura Main Road, Bengaluru South Taluk, Bengaluru.	Residential Apartment	65,000	
73	M/s. Vaishno Builders located at Sheegehalli Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	36,996.65	
74	M/s. Darshita Housing Pvt Ltd., located at Electronic City 2nd Phase, Konappana Agrahara Village, Begur Hobli, Bengaluru South Taluk, Bengaluru.	Commercial Development of IT Office Building	82,984.90	
75	M/s. Jaganmayi Infra Solution Pvt Ltd., located at Bellandur Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Commercial Development of IT Office Building	1,05,909.62	
76	M/s. Adwitiya Knowledge Park Qs LLP located at Thavarekere Village, Begur Hobli, Bengaluru South Taluk, Bengaluru.	Commercial Complex	80,208.10	
77	M/s. Universal Metro Properties LLP located at Bagalur Village, Jala Hobli, Bengaluru North Taluk, Bengaluru Urban District.	Residential Apartment	1,49,846.37	
78	M/s. Trishul Buildtech & Infrastructures Pvt Ltd., located at Nagavara Village, Kasaba Hobli, Bengaluru North Taluk, Bengaluru.	Commercial Building	65,449.11	
79	M/s. Brigade Enterprises Limited located at Siddapura Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Commercial Complex	1,80,000	
80	M/s. Brigade Enterprises Ltd., located at Kurubarakunte Village, Devanahalli Taluk, Bengaluru Rural District, Bengaluru.	Residential Villas	64,107.61	

81	M/s. Godrej Iris Mark LLP., located at Maragondahalli Village, Jigani Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	88,543.67	
82	M/s. Bren Corporation Pvt Ltd., located at Kaggalipura Village, Uttarahalli Hobli, Bengaluru South Taluk, Bengaluru.	Residential Apartment	55,720.51	
83	M/s. Bren Corporation Pvt Ltd., located at BBMP R.R. Nagar Zone & Hemmigepura Ward (198), Uttarahalli Hobli, Bengaluru South Taluk, Bengaluru Urban District.	Commercial cum Residential Apartment	54,611.83	
84	M/s. Mfar Madhuvan LLP located at Rachenahalli, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Office Building	42,844.43	
85	M/s. Divyasree Infrastructure Projects Pvt Ltd., located at Bellandur Ammani Khane Village, both of Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Mixed Used Development Project	6,88,867.30	
86	M/s. Janaadhar (India) Pvt Ltd., in the name of "Janaadhar Shubha" located at Sy. No. 39/1, 39/2, 40/3 & 42/1 of Medahalli Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	56,088.04	
87	M/s. Rajiv Gandhi Housing Corporation Ltd., located at , Kenchanapura Village, Kengeri Hobli, Bengaluru South Taluk, Bengaluru Urban District.	Residential Apartment	89,967.07	
88	M/s. Labzone – Electronic City Pvt Ltd., located at Doddathoguru Village, Electronic City, Phase – I, Begur Hobli, Bengaluru.	Commercial Building	94,190.52	
89	M/s. Candeur Constructions located at Kodigehalli Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	51,901.94	
90	M/s. Century Sheltors Developers Pvt Ltd., located at Amruthahalli Village & Bytarayanapura Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru.	Commercial Building 1, 2, 3 & 4 and a Club House	1,46,385.45	
91	M/s. Subadra Residential Development by M/s. Subadra Textiles Pvt Ltd., located at Magadi Main Road, Agrahara Dasarahalli, Bengaluru.	Residential Apartment	92,442.70	
92	M/s. NVR Developers located at Kumbena Agrahara Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	43,954.08	
93	M/s. Shreno Ltd., in the name of "Alembic City, Whitefield Bangalore located at Kadugodi Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru.	Non Residential IT/ITES Development	2,68,371.24	
94	M/s. Salarpuria Real Estate Pvt Ltd., in the name of "Senorita – II" located at Kasavanahalli Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	37,715.46	
95	M/s. Keya Homes located at Gollahalli Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	70,343.81	
96	M/s. Goel Ganga Realty Pvt Ltd., located at Old Seegehalli Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	1,07,316.68	

97	M/s. DS Max Properties Pvt Ltd., in the name of "DS Max Sky Subham" located at Kithaganoor Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	59821.03	
98	M/s. Sattva Developers Pvt Ltd., located at , Bommenahalli Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	34,187.37	
99	M/s. Brigade Enterprises Ltd., located at Chikkanayakanahalli Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	35,440	
100	M/s. Christ University located at Chokkasandra Village, Yeshwanthpura Hobli, Bengaluru North Taluk, Bengaluru.	Educational Institute/Office/Hostel Building project	1,49,602.14	
101	M/s. Central Industrial Security Force (CISF) located at Lakkur Village, Sompura Hobli, Nelamangala Taluk, Bengaluru Rural District.	Residential & Non – Residential Building	49,203	
102	M/s. Brigade Enterprises located at Dasarahalli Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Residential Apartment	79,592.91	
103	M/s. Trinayani Realtors Pvt Ltd., located at Udayagiri Village, Kasaba Hobli, Devanahalli Taluk, Bengaluru Rural District.	Mixed Development Project	1,30,019.87	
104	M/s. Mahendra Homes Pvt Ltd., located at Andhapura Village, Chandapura Purasabhe Attibele Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	1,18,337.79	
105	Sri. Akram Ahmed & Smt. Syeda Ayesha Siddiqa located at of Bikkanahalli Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	40,609.46	
106	M/s. G Corp Homes Pvt Ltd., located at Bengaluru East Taluk, Bengaluru.	Residential Apartment	3,41,359.56	
107	M/s. DNR Corporation Pvt Ltd., located at Yeshwanthpura Village, Yeshwanthpura Hobli, Bengaluru.	Commercial Building	1,07,404.49	
108	M/s. Svp Eco Enviro Solution located at , Jigani Village, Jigani Hobli, Anekal Taluk, bengaluru - 560105	CSTP		
109	L. Vinay, Hosahyadya Village, Kasaba Hobli, Doddaballapura Taluk, Bangaklore Rural District.	Residential Layout	66519.27	
110	M/s. Millennium Habitat Apartment Owners Association., Kundanahalli Village, ITPL Main Road, Next to CMRIT College, KR Puram Hobli,Bengaluru - 560 037	Residential Building		
111	M/s. ITC Limited, No.18, Banaswadi Main Road, Pulikeshinagar, Bengaluru - 560 005	Commercial Office / IT Building	2,25,100	
112	M/s. chikkaballapura Institute of medical Science (Proposed 1000 bedded Hospital 7 Academic Block For medical College and Allied Facilities at Chikkaballapura), Aruru Village Mandikal hobli, Chikkaballapura Taluk & district	Hospital		79.29

113	M/s. TBC Homes Infra Corp, Byagadadenahalli Village, Bengaluru Urban District	Residential Layout	40670.34	
114	M/s.Century Star,Lingadeeragolahalli Village, Kundana hobli, Devanahalli Taluk, Bangalore Rural District.	Residential Layout	94745.7	
115	M/s. NirmayBuilders & Developers LLP and Seven Hills Properties at Chokkahalli Village, Kasaba Hobli, Hosakote taluk Bangalore Rural District	Residential Layout	74,005.85	
116	M/s. Composite housing Scheme phase II by M/s. Karnataka Housing Board,Rayasandra Village, Kanakapura Taluk, Bangalore Urban, Ramanagara district	Residentail Layout	3,57,843	
117	M/s. D.S Max Properties Pvt Ltd.,Medahalli Village, sarjapura Hobli, Anekal Taluk, Bangalore Urban District	Residentail Apartment	33,723.50	
118	M/s. Shri Basaveshwara Veerashiva Vidyavardhaka Sangha, , Abbnakuppe, ittamadu Village, Bidadi Hobli, ramanagar Taluk & District	Educational Institute	53,214.12	
119	M/s. Icon Infra Shelters India Pvt Ltd.,Thindlu Village, Sarjapura Hobli, Anekal Taluk, Bangalore Urban District	Residential Layout		**12.21**
120	Proposed Residential Layout by M/s. Akarshak Reality Pvt Ltd., Ghattahalli Village, sarjapura hobli, Anekal Taluk, Bengaluru	Residential Layout	1,02,904.63	
121	Residential Layout of M/s. Concorde Sylvan View Byappanahalli Village and Maraganahalli Village Kasaba Hobli, Chickaballpura(T) and (D)	Residential Layout	83542.12	
122	Mahindra Lifespace Developers Ltd., BPL Software , Bannergahatta Road, Arekere Villlage Bangalore - 560 076	Residential Apartmernt	9877046	
123	BWSSB, 5 MLD Site No. 86, Singasandra Village & Hobli, ward No. 191, Bengaluru South Taluk, Bengaluru - 560 068	STP		
124	BWSSB, 35 MLD, site No. 36 & 37, Sector IV, HSR Layout, Begur Hobli, ward No. 174, Bengaluru - 560 102	STP		
125	M/s. Rajiv Gandhi Housing Corporation Ltd., Nelaguli Village, Uttrahalli Hobli, bangalore South Taluk, Bangalore Urban District	Residential Apartmernt		
126	M/s. Honnavar Port Pvt Ltd., No.103, Lalehzar Apartment , 45/1-2, Palace Road, Bangalore - 560 001.			
127	M/s. Rajiv gandhi Housing Corporation Ltd., Chikkellure Rampura Village, tavarekere Hobli, banglore South Taluk, bnaglore Urban District	Residential Apartmernt	28,124.28	
128	M/s. Rajiv Gandhi Housing Corporation Ltd., Site Nelaguli village, Uttrahalli Hobli, Bnaglore South Taluk, bnaglore Urban District	Residential Apartment	89,967.70	
129	M/s. Rajiv Gandhi Housing Corporation Ltd., at , Muddayanapalya Village, Tavarekere Hobli, Banglore South Taluk, banglore urban District	Residential Apartment	65,452.43	

130	M/s GSG Realty Residential Layout at , Akkupete Village, Kasaba Hobli, Devanahalli Taluk, Bengaluru Rural District	Residential Layout		**24.02**
131	Akarshak Infrastructure pvt Ltd., at Bhoganahalli Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru	Tech Park	4,19,972.86	
132	DSR Infra Projects., at Chikkakannahalli Village, Chikkakannahalli ,Varthur Hobli, Bengaluru East Taluk, Bengaluru	Residential Apartment	1,23,242.01	
133	Ressidential apartment by Sri.Arvind S Bhatnagar in the nmae of M/s. Janaadhar South One Projects LLp atCheeluru Village, Maralawadi Hobli, Kanakapura Taluk, Ramanagara District	Residential Apartment	24,303.93	
134	Mount Carmel Educational Society , , Palace Road,Vasanth Nagar, Bangalore - 560 052.	Educational Institute	52,727.69	
135	Godrej Properties Ltd., at Thiruvaranga Village, Anugondanahalli hobli, Hosakote Taluk, Bengaluru Rural District	Residential Layout	2,86,614.61	
136	Manyata Developers Pvt Ltd., Ilthore Village, Kundana Hobli, Devenahalli Taluk, Bengaluru Rural District.	Residential Layout	1,22,061.60	
137	M/s. Gopalan Foundation (Gopalan International Scholl), Sonnenahalli Village, KR Puram Hobli, Bangalore East Taluk, Bangalore	Educational Institution		
138	Prestige Estates Projects Ltd., Panathur Village, Varthur Hobli, Bengaluru	Mixed use Development Project	1,91,778.15	
139	Lowry Memorial College Group of Institutions., at Narayanapura Village, K.R. Puram Hobli, Bangalore East Taluk, Ward No-560 056, Banglore.	Educational Institution	43,611.08	
140	Apg lifestyle Homes Pvt Ltd., Doddajala Village, Jala Hobli, Yelahanka Taluk, Bengaluru	Residential Apartment		15.70
141	Prestige Office Ventures at Gunjur village, Varthur Hobli, Bengaluru East Taluk, Bengaluru	Commercial Office	5,19,894.15	
142	Rajiv Gandhi Rural Housing Corporation Limited " Pillahalli Site ", Pillahalli Village, Dasanapura Hobli, Bengaluru North Taluk , Bengaluru Urban District	Residential Apartment	21954.19	
143	Rajiv gandhi Rural Housing Corporation Limited " Agraharapalya Site ", ,Agraharapalya Village, Dasanapura Hobli, Bengaluru North Taluk , Bengaluru Urban District	Residential Apartment	21,665.70	
144	Rajiv gandhi Rural Housing Corporation Limited " Ganigarahalli Site ", , Ganigarahalli Village,Yashwanthpura Hobli, Bengaluru North Taluk , Bengaluru Urban District	Residential Apartment	20,234.28	
145	Residential Layout by Sri. KM Manjunath and sri D Munikrishna., of Byalalu Village, Tavarekere hobli, Bangalore.	Residential Layout	50,483.83	

ts from 01.07.2021 to 02.08.2022

Sl. No.	Name & Address of the Projects	Type Of Project	Built Up Area in Sq.m	LAYOUTS in Acres & Gunats
1	Apg lifestyle Homes Pvt Ltd., Sy.No. 82/1, 86/1, 86/2, 86/3, 86/4, 86/5(P), 86/6, 87 & 173/2, Doddajala Village, Jala Hobli, Yelahanka Taluk, Bengaluru	Residential Layout		15.17
2	Prestige Office Ventures at sy.No. 190, 191/3, 191/4, 191/5, 191/6, 198/1, of varthur village, varthur hobli, & sy.no. 206/4, 207/6, 207/7, 220/2a, 220/2b, 220/3, 220/4, 220/6, 220/7, 220/9, 220/10, 211/7, 221/2 of Gunjur village, Varthur Hobli, Bengaluru East Taluk, Bengaluru	Commercial Office	5,19,894.15	
3	Proposed Residential apartment in the name of GRC infra located at sy.No. 46, Choodasandra Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District	Residential Apartment	40,946.35	
4	Rajiv Gandhi Housing Corporation Ltd., Sy.No. 11, Doddanagamangala Village, Begur Hobli, Ward No. 192, Bangalore - 560 100	Residential Apartment	20,555.36	
5	VR Builders Developers Others, Sy.No. 206, 207/1, 207/2, 207/3, 207/4, 208/1, 208/2, 208/3, Doddahasala Village, Kasaba Hobli, Kolar Taluk & District	Residential Layout		12.16
6	Essenn Infratownship Pvt ltd located at Sy.no. 64/1, 64/2, 65, 66, 67, 68, 69, of Nallenahalli Village, Sy.No. 62/3, 67/5, 75, 74 of Thadur Village and Sy.No. 03, 04, 8/1, 8/2, 8/3, 8/4, 8/5, 8/6, 8/7, 8/8, 8/9, 8/10, 8/11, 8/12, 8/14, 9/1 & 9/2 of nadipinayakanahalli Village, Jangamakote Hobli, Shidlaghatta, Chikkaballapura District	Residential Layout		54.28
7	Brigade Enterprises ltd at Sy.No. 48,50, 51, 52, 53, 54/1A, 54/2, 54/3, 54/4, 56/1, 56/2, 57/1A, 57/1B, 57/2, 58, 59, 61/2, 62, 63, 64, 65/1, 65/2, 66/1, & 66/2, of Kithiganahalli Village, Attibele Hobli, Anekal Taluk and Sy.No. 73/P2, 74/1, 75/1, 84/2, 84/3, 85/1, 85/2, 85/3, 85/4, 86, 87/2, 88, 89/2, 94/1, 94/2, 94/3, 94/4, 94/6, 96, 97, 98, 100 of Banahalli Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District	Commercial Complex	4,73,753.73	
8	Shravanee Propteckh at Municipal No. 287, Plot Nos.4A & 4B, Doddanekkundi 1st Phase Industrial area in Sy.No. 73, Doddanekkundi Village, KR Puram Hobli, Bangalore East Taluk Banglore	Commercial Development	44,264.61	
9	Nambiar Enterprises LLP, Sy No. 128/2, 128/6 Muthanalur Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	49,464.62	
10	D.S. Max Properties Pvt Ltd., Sy No. 100, Bheeman Kuppe Village, Kengeri Hobli, Bengaluru South Taluk, Bengaluru Urban District.	Residential Apartment	41,448.95	
11	Urban Spaces Projects Pvt Ltd and Others Co Sobha Limited., Sy.No. 51/1(P), 51/2(P), 52/1(P), 52/2(P) & 53, Yadavanahalli, Attibele Hobli, Anekal Taluk, Bangalore.	Residential Apartment	1,54,006.78	

12	Jaganmatha Property Developers Pvt Ltd., Sy No. 10, 11/2, 12/1, 12/2, 15/1 & 15/2, 16/1 to 16/3, 17 of Gullobanahalli & Neeleri Village, Kasaba Hobli, Devanahalli Taluk, Bangalore Rural District.	Residential Layout		249.00
13	Proposed Commercial Office Building Development project in the name of "Prestige Tech Forest" by Sterling Gera Residence LLP at Survey No's. 47/1, 47/2, 47/3, 47/4, 47/5, 47/6 of Varthur Village, Varthur Hobli and Sy. No's. 58, 59/1, 59/2, 59/3, 60/1, 60/2, 62/1, 62/2, 63/3B, 65/1 of Khane Khandaya Village, Varthur Hobli and Sy. No's. 340/2, 340/3, 341/1, 341/2, 341/3, 341/4, 341/5, 342, 343/1, 343/2, 343/3, 344, 345/1, 346, 347, 349 of Ammani Bellandur Khane Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Commercial Building	3,44,473.48	
14	Svamitva Landmarks, Sy.No. 60/3, 60/4, 60/6, 60/7, 60/8, 60/9, 60/10, 60/11, 60/12, 95/1, 95/2, 95/3, 95/4, 95/5, 95/6, 95/7, 95/8, 95/9A, 95/9B, 95/10 & 95/12 of Vaderahalli Village, Harohalli Hobli, Kanakapura Taluk Ramanagara District.	Residential Group Housing & Wellness Centre	59,939.51	
15	Sports Authority of India, Bangalore Unviersity Campus Jhana Bharathi Complex, Netaji Subhas Raod, Sy.No. 69 & 77, Nayandahalli Village, Kengeri Hobli, Bangalore South Taluk, Bangalore Urban District - 560 056	Training Institution		74.26
16	Nandi Housing Private Ltd., BBMP Katha No. 51/20/1(20/2)20/P1,20/5, Sy.No. 20/1, 20-P1 & 20/5 of Kammanahalli Village, Begur Hobli, Bangalore South Taluk,Bangalore	Residential Apartment	95,357.43	
17	Lotus developed by sri Chidanand.K.S, Sy nO. 135, 132, 133, 134, 135, 136 & 137 of Kenjiganahalli Village, Madhure Hobli, Doddaballapura Taluk, Benagluru Rural District.	Residentail Layout	50,888.51	
18	Dr.M.C. Sudhakar, Sy.No. 18/4, 19/2, 19/3, 19/4, 19/5, 19/6, 19/7 & 19/8 of Kannampalli village, & Sy.No. 3/1, 3/2, 3/4, 3/5, 3/7, 3/8, 3/9, 4, 41/1, 41/2, 41/3, 41/4, 41/5 & 41/6 of Vadaganahalli Village, Kasaba Hobli, Chinthamani Taluk, Chikkaballapura	Residentail Layout	92297	
19	Platinum Narya Infra at Sy.No. 191, of Kannamangala Village, Biodarahalli Hobli, Bangalore East Taluk, Bangalore - 560 067	Residential Apartment	28,268.99	
20	Godrej Properties Limited located at Sy. No. 77, 175/1, 175/2A, 176/2A, 176/2B & 177 Kodathi Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Resdential Apartment	1,43,404.38	
21	Mr. R. Shankarappa located atBBMP Khatha No. 340/54, Sy. No. 54, Kenchanahalli Village, BBMP R.R. Nagar Zone, Heemmigepura Ward (198), Kengeri Hobli, Bengaluru South Taluk, Bengaluru Urban District.	Resdential Apartment	53188.14	
22	DS Max Realty Pvt Ltd., located at Sy. No. 99/2 & 100/1 of Madiwala Village, Kasaba Hobli, Anekal Taluk, Bengaluru Urban District.	Resdential Apartment	27,475.97	
23	MSR Tech Zone located at Sy. No. 147 of Munnekolalu Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Commercial Building	77,562.27	
24	Goyal Hariyana Developers located at Khatha No. 2990/58/70/1 & 70/2, Sy. No. 70/1, 70/2 of Balagere Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Resdential Apartment	66,778.87	

25	Darshitha Southern India Happy Homes Pvt Ltd., located at PID No. 10-1-42, Municipal No. 42, Site No. 11/1, 12, 12/1 & 13 of Yeshwanthapura – Industrial Suburb, Rajajinagar, Bengaluru.	Commercial Building	1,98,416.51	
26	Smt. Rashmi Kiran located at Sy. No. 69/1, 69/3, 69/4, 69/5, 69/6, 69/7, 69/8, 70, 72/1, 72/3 of Malarabanvadi Village, Kasaba Hobli, Nelamangala Taluk, Bengaluru Rural District.	Residentail Layout		13.2
27	Brigade Enterprises Ltd., located at Sy. No. 64/1B & 74/2A of Chikkallasandra Village, Uttarahalli Hobli, Subramanyapura Main Road, Bengaluru South Taluk, Bengaluru.	Resdential Apartment	30,618	
28	Abhee Developers located at Sy. No. 34/2B1, 34/5, 34/6 & 34/7 of Mullur Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Resdential Apartment	37,009.18	
29	Sekhar Builders & Infratech Pvt Ltd., located at Sy. No. 80/1, 80/2 & 80/4 of Dommasandra Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Resdential Apartment	45,524.58	
30	Total Environmental Building Pvt Ltd., located at Sy. No. 355, Bettahalasur Village, Jala Hobli, Yalahanka Taluk, Bengaluru Urban District, Bengaluru.	Commercial Complex	60,072.53	
31	Sobha Limited located at Sy. No. 35/3(P), 35/4(P), 37/1, 37/2(P), 38/1, 38/2(P), 38/1, 38/2(P), 38/4(P), 38/5, 79(P), 80/1, 80/2(P) & 80/3(P) Hosakerehalli Village, BBMP Rajarajeshwarinagar zone & Ward No. 160, Uttarahalli Hobli, Bengaluru South Taluk, Bengaluru.	Resdential Apartment	87,085.23	
32	Total Environment Building Systems Pvt Ltd., located at Sy. No. 226/2, 227/1, 227/2, 228/1, 228/2, 228/3, 229, 230/1, 230/2, 230/3, 230/4, 230/5, 230/6, 231/2, 231/3, 239/2B, 240/1, 240/2, 241, 242/1, 242/2, 244/2, 245/1, 245/2, 246/(P), 353, 354/1A, 354/1B, 354/2 & 355(P) of Bettahalasur Village, Jala Hobli, Bengaluru North Taluk, Bengaluru.	Residential Villas	94,398.72	
33	Sobha Limited located at Sy. No. 49/4, 49/7, 50/2(P), 50/3(P), 50/4(P), 51/1(P), 51/2B1 & 51/2B2 of Balagere Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru.	Resdential Apartment	1,06,722.47	
34	Sri. K.N. Bore Gowda located at Sy. No. 15/3, 16/2, 17/1A(P), 17/3(P), 18, 19/1, 19/2, 20, 21/1, 21/2, 22/1, 22/2, 23, 24/1, 24/2, 24/3, 24/4, 25/1, 25/2, 25/3, 25/4, 25/5 & 25/6 of Kolure Village, Tavarekere Hobli, Bengaluru South Taluk, Bengaluru.	Residentail Layout		14.27
35	Sobha Limited located at Sy. No. 47/1B & 47/2B of Kyalasanahalli Village, K.R. Puram Hobli, Bengaluru East Taluk, Bengaluru.	Resdential Apartment	82,793.98	
36	Vajram Estates Pvt Ltd., (Vajram Newtown) located at Sy. No. 58, 60, 61/1 & 64/1 of Chokkanahalli Village (Thanisandra Main Road), Yelahanka Hobli, Bengaluru North Taluk, Bengaluru Urban District.	Resdential Apartment	65,402.86	
37	Shankeshwar Landmarks LLP located at Sy. No. 54/1 & 54/2 of Haralkunte Village, Begur Hobli, Bengaluru South Taluk, Bengaluru.	Residential Apartment	89,640.10	
38	Bricks & Milestones Projects LLP located at Sy. No. 25/1, 26/1, 26/2, 27/4, 27/6, 31/1, 31/2, 31/4, 31/5, 31/6, 31/7, 63(P), 64 of Kada Agrahara Village, Sarjapura Hobli, Anekal Taluk, Bengaluru.	Residentail Layout		19.07

39	Bricks & Milestones Projects LLP located at Sy. No. 21/2, 12/3, 139/1, 139/2, 15/1 of Sompura Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	71,477.39	
40	Cosmos Realty & Leisure Pvt Ltd., located at Sy. No. 64(P), 65(P), 67/3, 67/4, 68/3, 68/4, 69/1, 69/2, 69/7, 69/8, 73/P4, 74/2, 74/3, 75, 76, 78/2, 79, 80, 81, 82/1, 83, 66/2 & 82/2 of Bettenahalli Village, Kundana Hobli, Devanahalli Taluk, Bengaluru Rural.	Residentail Layout		44.33
41	Bren Corporation located at Sy. No. 23/1A, 24/1A, 24/1B & 24/2A of Bandapura Village, Bidarahalli Hobli, Old Madras Road, Bengaluru East Taluk, Bengaluru.	Residential Apartment cum Commercial Building	89,070.30	
42	Primco Realty Pvt Ltd., at BBMP Khata No. 871/902/954/11, Sy.No.11(P), Ambalipura Village, Varthur Hobli, Bengaluru South Taluk, Bengaluru Ward No. 150	Commercial Building	31070.03	
43	Talreja Realty located at Khatha No. 1305/10/2, Sy. No. 10/2, Jakkur Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru.	Residential Apartment	35,011	
44	Grand Hills Developments Pvt Ltd., Sy.No. 35/2,35/4, 35/13, 45/2 to 45/10, 46/2 to 46/7, 48/3 to 48/6 & 49/2 to 49/6 of Kadiganahalli Village, Jala Hobli, Bengaluru North Taluk, Bengaluru	Residential Apartment	61,170.14	
45	Felicity Adobe LLP, Sy.No. 214/2, 215/1, 216/8, 216/9, 216/10, 216/11, 216/12, 216/13, 216/14, 216/15A, 216/15B, 216/16A, 216/18, 216/19, 216/20, Kakati Village, & Hobli, Belgaum Taluk & District	Residentail Apartment	1,04,254.25	
46	Azim Premji University, Sy.No. 53, 54, 58, 59, 60/1, 60/2, 60/3, 60/4, 60/5, 62, 79/1, 78/2, 62, 64/1, 64/2, 68, 69/1, 69/2, 70/1, 70/3, 71/2, 72/2, 73, 76/1, 77, 70/2, 79/2, 79/3, 79/4, 67, 72/3, 59, 72/1, 62, 66, 65, 71/2, 76/1, 53, 58, 77, 76/9, 49 & 48/2, Buragunte Village, Sarjapura Hobli, Anekal Taluk, Bengaluru	Educational & Residentail	2,48,389.47	
47	Proposed layout by Smt.Darshana Devi Goyal & Mrs. Urmila Devi Goyal, Sy.No. 51/1, 51/2, 51/3, 51/4, 52/1, 52/2, 52/3 & 54 Kanivenahalli Village, Kasaba Hobli, Malur Taluk, Kolar District	Residential Layout		17.15
48	Sanjeeveni Srusthi Infra, Sy.No. 34/1, Kacharakanahalli Village, Jadegenahalli Hobli, Hoskote Taluk, Bengaluru Rural District	Residential Apartment	44,056.65	
49	India Heritage Trust & Iskon Charities, Sy.No. 39/1, 39/2, 47/1, & 47/2 of Vasanthapura Village, 55/1, 55/2, 56, 57, 58, 59 & 60(P) of Doddakalasandra Village Uttrahalli Hobli, Bengaluru South Taluk Bengaluru	Residential Apartment & Commercial Complex	8,54,669.92	
50	S & M Developers at Sy.No. 47/1, 47/4(Old Sy.No. 49/6) of Balagere Village, Varthur Hobli, Bengaluru	Residentail Apartment	48,387.16	
51	Devas Global Services LLP, Sy.No. 40/1, 41/1, 41/4, 41/5, 42/1, 42/3, 44/1, 44/2, 44/3, 44/4, 44/5, 61/1, 61/2, 62, Kadiganahalli Village, jala Hobli, Bengaluru North Taluk, Bengaluru	Commercial Office Space	2,94,993.40	
52	Residential Layout by Reddy Veeranna Construction Pvt Ltd., Sy.Nos 57,58,59,60,61/6 & 61/7, Gudnahalli Village, Kasaba Hobli, Anekal Taluk, Bengaluru Urban District	Residential Layout		29.2

	Taluk, Bengaluru Urban District			
54	Sipani Properties Private Limited., Sy.No. 170/1, 171/1, 171/2A & 171/2B, Madivala Village, Kasaba Hobli, Anekal Taluk, Bengaluru - 560 099	Residential Apartment	49,386.21	
55	Artismo El-Nido., Sy.No. 77/3A, 77/3B, 77/4, 77/5, 77/6, 77/7, 77/9, 77/45, 77/16, 77/17, 78/8, 78/10A1, 78/10B of Chikkajala Village, Jala Hobli, Bengaluru North Taluk Bengaluru	Residential & Commercial	56,683.97	
56	Emerald Haven Development Limited, at Sy.No. 117/1 of Singasandra Village, 63/2, 63/3, 63/4, 63/5, 63/6 of Basapura Village, Begur Hobli, Bengaluru South Taluk, Bengaluru - 560 068	Residential Apartment	82,130.16	
57	Sri Balaji Lakeview at Sy.No. 34(P), 35/1(P), 35/2(P), 39/1(P), 39/2A(P), 39/2B(P), 39/3, 40/1(P), & 42 Byalakere Village, Hesaraghatta Hobli, Bengaluru North Taluk, Bengaluru Urban District - 560 090	Residential Layout	56,048.45	
58	Jai Infrastructure at Khata No. 442, Sy.No. 75/2 & 92/6 of Hoodi Village, K R Puram Hobli, Bengaluru East Taluk, Bengaluru - 560 048	Residential Apartment	30,818.10	
59	Soahan Serenity, Sy No. 2/1, 2/2, 3/1, 4/1, 4/5, 4/6, 4/7, 31/1, 31/2, 31/4, 33/1, 33/2, 33/3, 33/4, 34/1, 34/2, 34/3, 34/4, 34/5, 35/1, 35/2, 35/3, 35/4, 35/5, 35/6, 36/1, 36/2, 36/3, 36/4, 36/5, 36/6, 36/7, 36/8, 37/3, 37/4, 37/5, 37/6, 37/7 of Appajipura Village & 36/2A and 36/3 of Mallasandra Village, Hoskote Taluk, Bengaluru Rural District.	Residential Layout	121608.14	
60	Smt V Ramani, Sri. G Ravi & Sri V Rakesh at Khatha No. 1746, Sy.No. 76/5(Part), 76/5B, 76/5C, 77/1(Part), 77/3A(Part), Gunjur Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru	Residential Apartment	77,874.10	
61	Mista Infra Pvt Ltd., at Sy.No. 2/6, of Konadasapura Village, Bidarahalli Hobli, Bengaluru East Taluk	Mixed use Development Project	91,281.26	
62	R K Developers at Sy.No. 42, 43/1, 43/2, 43/4, 44/1, 44/2, 44/3, 45/1, 64/1 & 64/2 Chikkadasarahalli Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District	Residential Layout		16.12
63	**Residential Layout by Manyata Developers Pvt Ltd.** at Sy.No.6/1, 6/2, 6/3, 7/1, 7/2, 7/3A, 7/3B, 8/3, 9/1, 9/7, 10/7, 10/8, 53/2, 53/4, 53/17, 53/20, 53/21, 55/3, 55/4, 55/5, 55/6, 57/1, 57/2, 57/3, 58/2, 58/3 & 59/3 Ilthore Village, Kundana Hobli, Devanahalli Taluk, Bengaluru Rural District.	Residential Layout		30.6
64	**Sai Sravanthi Infra Pvt ltd** at Sy No.23, 22, 21/1, 21/2, 21/3, 124 & 125 of Seegehalli village, Bidarahalli Hobli Bengaluru East Taluk, Bengaluru.	Mixed use Development Project	3,44,603.80	

65	**Proposed Housing Scheme in the name of "Karnataka Housing Board"** at Sy No. 101, 140/3, 141, 142, 143, 144/1, 144/2, 145, 146, 147, 148, 149, 153, 156, 157, 158, 159/1, 159/2, 160/2, 160/3, 161, 162, 163/1, 163/2, 164, 165, 171/1, 171/2, 172/1, 173, 177, 178, 179/1, 179/2, 180, 181, 182, 183, 184, 185/2, 186, 192, 193, 194, 195, 196, 197, 198, 200, 201, 202,2, 203, 204 of Bellikere Village, Anugondanahalli Hobli, Hoskote Taluk, Bengaluru Rural District.	Residential Layout	3,14,235.78	
66	**Residential Layout by Sri Jawahar Doreswamy & Sri Ajoy Kumar** at Sy.No. 13/4A, 14/1, 14/4, 14/5, 14/6, 14/7, 14/8, 14/9 & 15/1, 15/2, 15/3, 15/4, 15/5, 15/6, 15/7A, 15/7B, 15/8, 15/10, 16/1, 16/2, 17/5, 17/6, 17/7, 17/8, 17/9, 17/10, 20/1 & 20/2 of Doddabele Village, Kengeri Hobli, Bengaluru South Taluk, Bengaluru Urban District, Bengaluru.	Residential Layout		30.25
67	Sri Shravanth P in the name of Modern Spaces Sy.No. 39 & 40/2 Kadaagrahara Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District	Residential Apartment	62,206.97	
68	H Gopala Reddy Sy.No. 1/1, 3/1, 3/2, 3/3, 3/5, 4/2, 15/1, 15/2, 15/6, 15/7, 16/2, 16/3, 16/4A, 16/4B, Agrahara Village Yelahanka Hobli, Bengaluru North Taluk, Bengaluru	Residential Layout		22.8
69	Casa Grande Garden City Builders Pvt Ltd., located at Sy. No. 1 & 56, Doddabettahalli Village, Yelahnka Hobli, Bengaluru North Taluk, Bengaluru.	Residential Apartment	54,078.72	
70	**Residential Layout by Terracon Infra,** Sy No. 34, 35/1, 36, 39/3, 39/5, 41/1, 42/2, 45/1, 47/1, 2 & 3 of Anagalli Village, Srirangapatna Taluk, Mandya District.	Residential Layout		22.31
71	JR Housing Developers Private Limited., Sy.No. 89/2, 89/9, 89/10, 89/11, 90/1, 90/4, 90/6, 90/8, 90/10, 90/11, 90/12, 90/13, 90/14, 90/15, 90/16, 90/17, 90/18, 90/19, 90/20, 90/21, 90/22, & 90/22 & 97/1A of Jinnagara Village, Jadigenahalli Hobli, Hoskote Taluk, Bengaluru Rural District	Residentail Layout		23.38
72	Mantri Infrastructure Pvt Ltd., No. 1, 2nd Main Sampige Road, Malleshwaram, Bengaluru - 560 003	Mixed use Development Project	1,95,519.49	
73	Mantri Garden View Homes Pvt Ltd., Mantri Blossom, New Municipal No. 69, Old PID No. 48-55-69, New PID No. 118-MO 116-106-1, No. 69, Lalbagh Fort Road, sudhamanagara Bengaluru - 560 002	Residential Apartment	83,266.57	
74	Residential Layout By Smt Kousalya Devi Baldawa at Sy.No. T.S No. 1077B, Bandihatti, Cowl Bazar, Ballari District, Karnataka	Residential Layout		14.20
75	Delta Electronics India Pvt Ltd., Plot No. 69-B, 69-C & 69-D, (Sy.No. 56 & 57 of Bommasandra Village), Bommasandra Industrial Area, Hosur Road, Attibele Hobli, Anekal Taluk, Bengaluru - 560 099	Software Units	81,402.76	
76	Sai Kiran Constructions at BBMP Khatha No. 2390/55/1655/2, Sy.No. 55/1, Uttrahalli Village, Uttrahalli Hobli, BBMP Uttrahalli Ward 184, Bengaluru South Taluk, Bengaluru Urban District	Residential Apartment	35,595.29	
77	Mantri Infrastructure Pvt Ltd., No. 41, Vittal Mallya Road, Bengaluru - 560 001	Residential Apartment	1,95,519.49	

78	Mantri Garden View Homes Pvt Ltd., No. 41, Vittal Mallya Road, Bengaluru - 560 001	Residential Apartment	83,266.57	
79	GK Builders Sy.No. 149/1, 150/1, 150/2, 150/3, 150/4, 150/5, 170/1, 170/2, 170/3, 170/4, 170/5, 170/6, 170/7, 170/8, 170/9, 170/10, 170/11, 171/1, 171/2, 171/3, 171/4, 173/P of Kundana Village, Kasaba Hobli, Devanahalli Taluk, Bengaluru Rural District	Residential Layout		21.14
80	Ds Max Properties Private Limited, at Sy. No. 76/10,Medihalli Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District.	Residential Apartment	15,802.39	
81	Adrash Nivas Private Limited, Sy.No. 60/1, 60/2, 60/3, 60/4P, 61, 111/1, 111/2, 111/6, 112/1, 112/2, 122/1, 122/2, 122/3, 123/1, 123/2, 123/3, 123/4, 126/1, 126/2, 126/3, 127, 128P, 129/P, 130/1P, 131/1, 171, 172, 173, 174, 175, 176, 177 of Huttanahalli Village Jala Hobli, Bengaluru North Taluk, Bengaluru	Residential Villas	11150.87	
82	Hebbal Infrasapce Private Limited, Sy No. 107/1(P), 116/1, 117/3(P), 118/1(P), 118/2(P), 119/1, 119/2, 119/3(P), 119/7(P), 122/1, 122/2 of Amruthahalli Village and Sy No. 18/1(P), 18/6, 18/7, 18/8, 18/9, 19/1(P), 19/4(P), 19/5(P), 19/6(P) of Byatarayanapura Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru Urban District	Commercial Building	1,47,596.14	
83	Sri. D Kantha & Sri Dinesh Kumar Jain at BBMP Khatha No. 368/Sy.No. 3/2C, & 17/229/17/1 & 2/3/3A2.3/3C2/17,2B.17/1 & 2/17/2B, Sy.No. 3/2C,3/3C2, 3/3A2, 17/2B & 17/112, Ganakalli Vullage, Uttrahalli Hobli, BBMP Hemegapura Ward (198), Bengaluru South Taluk, Bengaluru Urban District	Residential Apartment	51,574.72	
84	Dai Doron India Properties Private Limited., at Sy.No. 173/1, 174, 175/1, 175/2, 175/3, 175/4, Bukkasagara Village, Jigani Hobli, Anekal Taluk, Bengaluru	Residential Layout		16 A 20.75 G
85	TBC Home Infra Corp, Sy.No. 73/2, 74/4, 76, 77/1, 77/2, 77/3, 77/4, 77/5, 77/6, 77/7, 78/3, 78/4, 79/1, 79/2, 79/3, 80/1 & 80/2, Bhyagadadenahalli Village, Kasaba Hobli, Anekal Taluk, Bengaluru Urban District 562 125	Residential Layout	67,708.02	
86	Jeevan Developers at Sy.No. 95/3, 95/4, 95/5, 95/12 & 95/13, Sheegehalli Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru	Residential Apartment	54,938.72	
87	Trifecta Projects Pvt Ltd., at Sy.No. 7/1, 7/2, 7/3, 8/1P, 8/3, 9/2, 9/3, 9/4, 9/6(old 9/5) & 11/2 of Jyothipura Village, Bidarahalli Hobli, Bengaluru Esat Taluk, Bengaluru	Residential Layout		11.22
88	DSR Infrastructure Pvt Ltd., at Sy.No. 70 & 71 (New Sy.No. 319/1 & 319/2) of Gunjur Village, Varthur Hobli, Bengaluru	Residential Apartment	42,234.83	
89	Total Environmental Habitat Pvt Ltd., Sy.No. 175, 172/1, 170/1A, 170/1B, 170/2, 172/2, 169/1,2,3,4, 176/3, 177,136/2 & 137 of Hoodi Village, KR Puram Hobli, Bengaluru East Taluk	Mixed Used	5,92,346.00	
90	Akshay Enterprises, Sy.No. 12/4, 12/7(p), 12/9, 15/1, 15/3, 16/1, 16/2, 16/3, 17/6 & 17/9 of Chikkabellandur Village, Varthur Hobli, Bengaluru East Taluk, Bengaluru	Residential Layout		20.06

91	HAL	Residential Apartment/quarters	57,696	
92	KUL Urban Development Private Limited at Sy.No. 35, 44, 45, 46, 47 & 48 of Gangasandra Village, Kengeri Hobli, Bengaluru South Atluk, Bengaluru Urban District	Residential Layout		29.24
93	Residential Apartment Building Project by Saritha Developers at Sy.No. 43/1 & 43/2 of Gunjur Village, Varthur Hobli, Bengaluru.	Residential Apartment	55,210.22	
94	Jain Heights & Structures Pvt Ltd., No.2, Souls,2nd Floor, 1st Cross, J.C.Road, Bengaluru - 560 002	Residential Apartment	43,726.20	
95	Casa Grande Garden City Builders Private Limited., Sy.No. 15, Srinivaspura Village, Yelahanka Hobli, Bengaluru North Taluk, Bengaluru	Residential Apartment	85,905.62	
96	Garudachala Estates Private Limited at Khatha No. 886/35/186, Sy.No. 35/3 of Medahalli Village, Bidarahalli Hobli, Bengaluru East Taluk	Residential & Commercial	47159.94	
97	SBR Infra Buildtech, at Sy.No. 121/2, 121/5, 121/6, 121/7 & 122/1 of Seegehalli Village, Bidarahalli Hobli, Bengaluru East Taluk	Residential & Commercial	1,31,232.62	
98	Iconica Projects, at Sy.No. 5/1, 5/2, 7/2, 7/3, 10/2, 44/2, 44/5, 45/2C, 46 & 47 of Manchanalli Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District	Residential Apartment	2,44,807.00	
99	Information Technology Park Limited (ITPL), Sy.No. 80, 83, 85 & 86 of Sadaramangala Village & Sy.No. 113/1, 113/2, 114/1, 114/3B, 116, 117, 118, 119, 110/2, 111/2, 115/1, 115/2, 115/2, 115/3 & 114/3A of Pattandur Agrahara Village, all of KR Puram Hobli, Bengaluru East Taluk, Bengaluru - 560 066	Software Units	1,31,970.00	
100	Proposed Composite Housing Scheme Suryanagar Phase II Sy.No. 49, 5/4P, 6/1, 7, 8/1 to 196/1 to 3 of Hinnakki Village, Jigani Hobli, Sy.No. 380/1, 389 to 396 & others of Marasur Village, Kasaba Hobli, Sy.Nos 7, 12, 128 & Others of Lingapura Village, Kasaba Hobli, Anekal Taluk, Bengaluru Urban District	Residential Area	30,56,905.26	
101	Elite Estates, Sy.No. 135/1, 136/1 Ofd Gokare Village & 258/1, 258/2, 258/3, 259/2, 260/1, 260/2, 274/1, 275/3 of Kasaba Hobli, Devanahalli Taluk, Bengaluru Rural District	Residential Layout		14.28
102	Ruchira Developers LLP & Sri Lakshmi Venkateshwara Infra LLP at Sy.No. 188 & 189, Kannamangala Village, Bidarahalli Hobli, Bengaluru East Taluk, Bengaluru	Residential Apartment	70,369.03	
103	Aratt Centrum at Sy.Nos 67/3 & 67/4, Maragondanahalli Village, Jagani Hobli, Anekal Taluk, Bengaluru Urban District 560 099	Residential Apartment	48,764.74	
104	Smt R Ashwathalakshmamma at Sy.No. 148/1, 148/2, 190/2, 197/2, 200, 201/1, 201/2, 201/3, 201/4, 201/5 of Sreegiripura Village, Kuduru Hobli, Magadi Taluk, Ramangara District	Residential Layout		19.35
105	Janaseva Trust Sy.No. 16, Chennenahalli Village, Tavarekere Hobli, Magadi Road, Bengaluru South Taluk, Bengaluru Urban District 562130	Commercial Building	1,03,367.18	
106	**United Projects Suncity at Sy.No. 3/1A3, 8/5, 9/7, 30/3 of Sadaramangala Village, KR Puram Hobli, Bengaluru East Taluk,**	Residential Apartment	62,054.70	

107	Sri. K.N.Avalappa, Smt.Pankaja & Sri Y.N.Honnaraja at Sy.No. 154/8, 154/22, 154/32, 154/33, 154/34, 154/35, 154/35, 154/36, 154/37, 354/38, 154/39, 154/40, and 154/41 of Tavarekere Village, Tavarekere Hobli, Bengaluru South Taluk, Bengaluru Urban District	Residential Layout		16.27
108	Sri Pradeep Krishnappa S/O M Krishnappa at Sy.No. 89, 90, 91/1, 91/4 & 91/6 of Ajjanahalli Village & Sy.No. 62/7, 63/39 & 63/59 of Hullavanahalli Village, Tavarekere Hobli, Bengaluru South Taluk, Bengaluru Urban District	Residential Layout		11.14
109	Sri Srinivasa Educational & Chaitable trust, Sy.No. 8/2, and 14/5A, Khata No.4, Chikkasandra Village, Yeshwanthapura Hobli, Bengaluru North Taluk, Bengaluru Urban District	Commercial Building	117884.42	
110	Puravankara Limited, Municipal No. 74, PID No. 32-1-74, Magadi Main Road, New Ward No. 122, Kempapura Agrahara, Bengaluru 560 023	Residential Apartment	67106.71	
111	**DS Max Properties Private Limited,** at Sy.No. Sy.No. 58/5, Bendiganhalli Village, Attibele Hobli, Anekal Taluk, Bengaluru Urban District	Residential Apartment	18,292.29	
112	**United Infrastructures** at Sy.No. 6/4, 6/3 of Sadaramangala Village, KR Puram Hobli & Sy.No. 40/5 of Kumbena Agrahara Village, Bidarahalli Hobli, both of Bengaluru East Taluk, Bengaluru Urban District.	Residential Apartment	62,054.70	
113	**Atco Infrastructure Private Limited,** at Sy.No. 68/1, 68/2, 68/3, 71, 72/3, 72/5 & 73/3, Handenahalli Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban Dsitrict	Residential Apartment	1,28,925.70	
114	Casa Grande Garden City Builders Pvt Ltd., Sy.No. 50, Haralakunte Village, Begur Hobli, Bengaluru South Taluk, Bengaluru - 560 068	Residential Apartment	53,124.98	
115	Upakar Residences Private Limited, at SY No. 53/1, 64/2 & 67 of Indlabele Village, AttibeleHobli, AnekalTaluk, Bengaluru Urban District.	Residential Layout		**11.07**
116	United Developers at Khata No. 1119, Sy.No. 113/1, 133/2 & 113/6 of Nagondanahalli Village, K.R.Puram hobli, Bengaluru	Mixed Used Development	43,410.38	
117	S2 Homes, at Sy.No. 397/2 of Sarjapura Village, Sarjapura Hobli, Anekal Taluk, Bengaluru Urban District	Residential Apartment	23,570.20	
118	M R Infra Sy.No. 51/3, 52/1, 56/1, 56/2, 57/1, 57/2, 60/3, 60/4, 62/3 7 62/4 of Dharapura Village, Kasaba Hobli, Ramangaram Taluk & District	Residential Layout		16.19
119	Dr Shivaram Karanth Layout Scheme., by varoius Sy.Nos of Varoius Villages, yelahanka hobli, Bengaluru north taluk, bengaluru urban district	Residential layout		3,546.12
		TOTAL	**1,27,14,279.36**	**4417.83**

BENGALURU C&D WASTE GENERATION DATA FROM 1.1.2020 TO 31.7.2022

NO	PARTICULARS OF BENGALURU	TOTAL BUIT UP AREA IN SQ MT.	LAYOUTS IN ACRES	C&D WASTE GENERATED IN TONNES
1	Data of Consents accorded 1.1.2020 to 31.7.2022 (30 Months) by KSPCB	3,75,57,057.91	4629.6	2810943.11
2	Smaller projects less than 175 Flats or less than 2.75 L SFT (considered as 50% of above, as they are more in mumber)			1405471.56
3	Demolition of buildings (can be considered 10% of the total buit up. Example one Le Meridian Hotel demolished a 10 Lakh SFT of building)			421641.47
4	The public works, metro and smaller independent repair and demolition at 50% of the major projects			1405471.56
5	TOTAL C&D WASTE GENERATED IN 30 MONTHS			6043527.70
6	AVERAGE TONS OF C&D GENERATED PER MONTH			201450.92
7	**AVERAGE TONS OF C&D GENERATED PER DAY**			**6715.03**